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THE
CHIRURGICAL WORKS
OF
BENJAMIN GOOCH,
SURGEON;

H. Daniel

A NEW EDITION,

WITH HIS LAST CORRECTIONS AND ADDITIONS.

IN THREE VOLUMES,

VOL. I.

CONTAINING

A PRACTICAL TREATISE ON WOUNDS AND
OTHER CHIRURGICAL SUBJECTS.

To which is prefixed,

A SHORT HISTORICAL ACCOUNT OF THE RISE AND
PROGRESS OF

SURGERY AND ANATOMY,

Addressed to Young Surgeons.

LONDON:

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MDCXCII.

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OF BRISTOL
MEDICINE

T O

Y O U N G S U R G E O N S .

GENTLEMEN,

I OFFER these papers to you, from a desire of being as useful as I can in my profession. They are founded upon the lectures of the most eminent professors, the practice of the hospitals, and the ablest surgeons at home and abroad; and contain the sentiments of the ancients and moderns: among which are interspersed observations, practical remarks, and such reflections as my own experience and diligent attention for full forty years, have furnished me with.

I will not doubt of your favourable acceptance of this *opusculum*, nor of your can-

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did interpretation of the quotations, which are made with a desire of raising in your minds a spirit of emulation, and inciting you to consult those distinguished writers, I am indebted to, who will more amply reward your inquiries. — When I was a young man I wished for a plain, methodical guide upon this subject ; and if what I have written shall afford you any assistance in your studies and pursuits, my endeavours will be fully recompensed.

By beginning early to make observations, taking minutes of extraordinary occurrences in practice, and making them occasionally the subjects of reflection, you will receive great advantages. From such rational experience, you may expect to acquire a requisite degree of confidence in yourselves, animating you to proceed in your business with proper resolution and steadiness, to accomplish the several ends you may have in view.

Pursue, with zeal and perseverance, the steps that lead to knowledge and understanding in your profession, to support the
credit

credit and dignity of surgery, for your own honour and the public good; in which I wish you all imaginable success, and am,

GENTLEMEN,

Your faithful and affectionate

Friend and Servant,

B. GOOCH.

NORWICH,
Jan. the 1st, 1766.

The following extracts are from the preface to an abridged translation of the preliminary discourse to the 1st vol. of the *Mem. de l'Acad. Roy. de Chirurgie*, printed in the year 1760, for *Wilson and Durham*.

“ Those who intend bringing up their children in
“ surgery, should give them as much preparatory edu-
“ cation, as if they designed them for the university :
“ also the French tongue, the mathematics, especially
“ mechanics, drawing, and stenography, if not abso-
“ lutely necessary, are very useful accomplishments for a
“ surgeon, and they certainly will be found so upon
“ many occasions, in the pursuit of his studies ; a com-
“ petent knowledge of which may be easily obtained by
“ an early and proper application.

“ Those of a suitable genius and thus qualified, who
“ shall be put apprentices, even in the country, to able

“ and instructive masters, afterwards attending assidu-
 “ ously in *London* to anatomy, surgery, experimental phi-
 “ losophy, &c. may become ornaments in their profes-
 “ sion, and may be enabled, by these means, to express
 “ and conduct themselves in such a manner, as will ef-
 “ fectually recommend them to the world, and support
 “ the character and dignity of an art that has been highly
 “ honoured in all ages.”

“ As the symptoms of latent diseases are often very
 “ equivocal, the diligent observance and minuting of
 “ them down before the death of the patient, and the
 “ accurate inspection of the body after, might greatly
 “ improve the *diagnostic* and *prognostic* part of the medical
 “ art : and in process of time, by these measures, perhaps
 “ better *criteria* might be established to direct the judg-
 “ ment in the curative indications ; or when it happens
 “ that the disease is incurable in its nature, it is not a
 “ little to the honour of the physician or surgeon to be
 “ able to preface the event of it ; yet opportunities of
 “ making remarks and observations, in this useful and
 “ instructive manner, can seldom be had but in hos-
 “ pitals.”

That discourse which was written by doctor *Quesnay*,
 an excellent French writer, has been much admired ;
 and indeed I think it deserves an attentive perusal better
 than any thing I have seen upon the subject.

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T H E

INTRODUCTION.

THE medical art is comprised under these three general heads ; *Physiology*, *Pathology* and *Therapeutics*, or the method of curing diseases, consisting of diet, medicine, and manual operation ; the latter of which is the province that falls peculiarly to the surgeon's share.

Writers have divided Surgery into these six branches: *Synthesis*; *Diæresis*; *Exæresis*; *Aphæresis*; *Prosthesis*; and *Diorthosis* : the first signifies uniting parts divided : the second dividing parts united : the third removing or extracting extraneous or other noxious substances, lodged in any part of the body : the fourth taking away what is superfluous : the fifth supplying deficiency : the sixth restoring parts to their proper places.

The daily instances of the relief which surgery brings the afflicted, under the various circumstances of distress, even delivering them from the jaws of death, sufficiently proclaim it's excellence ; and it appears to be of much earlier date, than the other parts of the medical art.

We see by the *antediluvian* history, that soon after the creation of the world, feuds and animosities, envy and malice, possessed the minds of men, productive of rapine and war, which inevitably exposed the contending parties to wounds, and other external injuries.—Reason, implanted in man for his preservation, as the first principle in nature, directed him on various occasions, to seek a remedy ; and this necessity gave rise to surgery, which at first was rude and imperfect, gradually growing, in successive ages, like other ingenious arts and sciences, to a state of perfection.

The inhabitants of the earth, in the primitive ages of the world, lived frugally upon plain simple food, according to the dictates of nature and right reason ; and, enjoying a pure serene air and temperate climate, their lives were protracted to a great length, without being so subject as we are to diseases, which have been much increased since that time by luxury and intemperance. They were peculiarly happy in the enjoyment of robust
and

and vigorous constitutions, raised from good original stamina; and when attacked with diseases, nature wanted little or no assistance from art, to restore their health; consequently surgery was then looked upon, as almost the only necessary branch of medicine.*

Ancient history informs us, though there may be something fabulous and allegorical in it, that *Apollo* communicated his skill in this science to his son *Æsculapius*, who then profited under the tuition of *Chiron* the Centaur; and for his great improvement and knowledge of it, surgery in particular, he was deified, and had temples dedicated to him in several parts of the world. Many countries contended for the honour of his birth, and, according to the learned, his name signifies a man of the knife, in the *Phenician* language; whence some writers conclude he was a native of *Phenicia*; but this controverted point, whether he was by birth a *Phenician*, an *Egyptian*, or a *Grecian*, is not material to our purpose. In those early days there were no regular professors of the medical art, the knowledge of which was then

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conveyed

* Vid. Differtat. physico-med. Fred. Hoffmanni de Methodo acquirendi Vitam longam. The great luxury of the Romans in Seneca's time made him say, *Non ad rationem sed ad similitudinem vivimus.*

conveyed by oral tradition, or recorded upon pillars in the most public places, or on the walls of temples, dedicated to the God of Health; and afterwards registers of cures were kept in those consecrated places for the general good of mankind.

Machaon and *Podalirius*, the sons of *Æsculapius*, were both medical and military men, and being particularly skilful in surgery, they proved very useful to the soldiers in curing their wounds, in the *Trojan* war; on which account, when *Machaon* himself was dangerously wounded with a dart, greater lamentation was made for him than for any other hero.

From the destruction of *Troy* to the *Peloponnesian* war, which was an interval of more than seven hundred years, the *Asclepiadæ*, descendants of *Æsculapius*, and their disciples, were the only noted professors of the healing art.

About the conclusion of this period of time, the immortal *Hippocrates* began to be famous in the world, who was also of the *Æsculapian* family, and lived between four and five hundred years before our *Saviour*. He was endowed with the greatest sagacity, excelled all his predecessors and contemporaries, and reduced this science into better order, compiling, and laying down for posterity, rules
founded

founded upon his own observations, confirmed by experience, and was deservedly called the father of physic. In his writings he also treats of wounds, ulcers, fractures, &c. interspersing observations and remarks through the whole, to direct the judgment and practice of succeeding ages. He was the ablest surgeon, as well as physician, of his time.

The other Greek physicians, whose writings have been transmitted to us in a more universal language, treating also professedly of surgery, are *Oribasius*, *Alexander*, *Trallianus*, *Ætius* and *Paulus Ægineta*, and the great *Galen*, who flourished more than a century before *Oribasius*.*

Among the Romans, *Celsus*, a man of a sublime and penetrating genius, is the only author we have in his time, though he mentions several; but there is no other record or monument of them left. Both he and *Galen*, who was a practitioner of great repute at *Rome*, though a native of *Pergamus* in *Asia Minor*, speak of some ancient

B 3

surgeons,

* *Oribasius* was a practitioner of great note at *Sardis*, in Cent. IV. Æ. C.—What he has said, de Laqueis et Machinamentis, in his voluminous works, is chiefly taken from *Heliodorus*.—It appears that *Paulus* was a more considerable surgeon, having improved upon his predecessors.

furgeons, as well in *Egypt* as in other parts of the world, whose works have perished.

When the knowledge of arts and sciences was transferred from *Egypt* to *Greece*, it received great improvements, and *Athens* was looked upon as the seat of all kinds of learning, till the death of *Alexander* the Great; after which æra the *Ptolemies* ruled in *Egypt*, and *Alexandria* became the most renowned school in the world, for physic, surgery, and anatomy, which flourished near a thousand years: and in those days, physicians boasted of receiving their education in that university. Then the different branches of medicine were practised together, and not separated till the time of *Herophilus* and *Erasistratus*, who were educated at *Alexandria*, and lived in the reign of *Seleucus Nicanor*, king of *Syria*, as appears by a memorable incident, in respect to the latter of those illustrious men, who showed his great penetration in discovering *Antiochus's* distemper, when fallen desperately in love with his mother-in-law, the young and beautiful *Stratonice*, *Seleucus's* second wife, whom he had married in his old age.*

In the year 640 of the Christian æra, the caliph of the *Saracens*, professed enemies to literature,

* *Seleucus* began his reign Ao. Mdi. 3684. *Erasistratus* resided at his court, and was archiater.

rature, as well as to the Christians, took *Alexandria*, destroyed the university, and burnt the library of *Ptolemy Philadelphus*, which was the greatest magazine of learning in the world, said to contain 700,000 volumes;* however, some books might be saved out of that lamentable conflagration.

In the same century that this dreadful catastrophe happened at *Alexandria*, *Europe* was overrun with *Goths* and *Vandals*, by which calamitous event, the liberal arts and sciences also suffered very much; and undoubtedly medicine shared the same fate.

After the fall of *Alexandria*, and the irruptions of those barbarous people, the *Arabians*, having collected libraries, and probably possessed themselves of some books, that were saved out of the flames at *Alexandria*, became more conspicuous and considerable in this science, than any other nation; of which, the most eminent who blended surgery with their other medical writings, were *Rhazes*, *Avicenna*, *Avenzoar*, *Averrhoes*, and *Albucafis*.

Rhazes probably was born in the province of *Chorasan* in *Persia*; he was superintendent of an

B 4

hospital

* Great part of the *Ptolemean* Library having been burnt in the wars between *Cæsar* and *Pompey*, the loss was supplied, as far as possible, by *Cleopatra*, queen of *Egypt*, and her successors, at an immense expence.

hospital there, and died advanced in years, A. C. 932.

Avicenna was the next writer of note among the *Arabians*; he was born at *Bochara* in *Chorasan*, towards the end of the 9th century. He resided and practised at *Ispahan*. He was a man of extraordinary talents; but shortened his days by intemperance and indulgence in pleasures; he was buried at *Hamadan*.

Avenzoar succeeded *Avicenna*; if not born, he resided much at *Seville*, the capital of the province of *Andalusia* in *Spain*, then the seat of the *Mahometan* caliph. He lived and enjoyed good health to 135 years.

Averrhoes followed *Avenzoar*; he was a native of *Corduba* in *Spain*, and died at *Morocco*.

Of *Albucasis* the place and time of nativity do not certainly appear; but he comes after *Averrhoes*, and was the best acquainted with surgery of any of the *Arabians*. There is reason to suppose that he lived in the 11th or 12th century of the Christian æra.

These *Arabians* were favourers of *Galen's* doctrine, and their authority prevailed unrivalled for many ages.

Afterwards the chemists opposed the *Galenists*, each of which had zealous partizans, who
were

were bigotted to the opinion of their chiefs, and combated each others notions with great vehemence, whence a kind of schism arose in the province of physic; but the wiser moderns have freed themselves from implicit faith, and the embarrassments of hypotheses, and fine speculative systems, more curious than useful, regarding only what is founded upon rational experience, to which theory must be subordinate.

In the 13th century learning emerged from the dark clouds of ignorance, under which it had long been veiled; and about this period of time, the reformation of surgery was begun in *England* by *Arden*,* originally a practitioner of great fame at *Newark*, and afterwards in *London*: and it was begun rather earlier in *France*, by *Pitard* and *Lanfranc*.† By a succession of men of genius, learning and application here, such as *Gale*, *Clowes*, *Woodall*, *Banister*, *Wiseman*, and many others; and there, by *Vavasseur*, *Mondeville*, *Guido de Cauliaco*, *Paré*, *Guillemeau*, &c., surgery was gradually advanced, in both countries, to it's present state of perfection. *Pitard* was a Parisian by birth, but *Lanfranc* was a native of *Milan*,
educated

* Vid. Opera I. Friend, M. D. de Historia Medicinæ.

† See Histoire de l'Origine & des Progrès de la Chirurgie en France.

educated at *Salernum*, the most famous university for physic and surgery in those days, as it's motto, *Civitas Hippocratica*, emphatically expresses. He was driven from *Italy*, with many other learned men, by the dreadful factions of the *Guelphs* and *Gibelines*, at the conclusion of the 12th century, and found an asylum at *Paris*, where he met with a very honourable reception. His acquaintance with *Pitard* was soon improved into a strict friendship, which was inviolably preserved, for the public good, between these eminent men, who, co-operating, supported with great credit and dignity, the college of *St. Côme*, founded by *Lewis* the Ninth, who was sainted for engaging in the crusades; and there public lectures were appointed to be read, and demonstrations made, in anatomy and surgery, by the royal founder. *Pitard* having given early proofs of his extraordinary talents and abilities in his profession, was honoured, before he was thirty years of age, with the appointment of first surgeon to the king, and standing in the highest esteem, attended him in his expedition to the *Holy-Land*, where he gathered laurels, and returned loaded with honours.

Our neighbours having had for some ages, better opportunities, from royal' patronage, of acquiring knowledge in their profession, than other countries,

countries, and being regular in giving lectures, and making demonstrations in anatomy and surgery, they distinguished themselves, and were deservedly extolled throughout *Europe*: and from every part of it, surgeons used to resort to *Paris*, to complete their education, which now can no longer claim the superiority to *London*, only in respect to the Royal Academy of Surgery, a late institution, truly worthy of a great prince, having the general good of his people, and the glory of his country at heart.—Were the propriety and utility of such an establishment represented, in it's true light, to his most august majesty, the king of *Great-Britain*, it is highly probable he would be graciously pleased, to give all due encouragement and sanction, to such a beneficial foundation in his metropolis.

In the foreign universities, the professors of physic generally adopted surgery; and now, at the famous university of *Edinburgh*, and others, there are professorships appropriated to surgery and anatomy conjointly. *Marianus Sanctus*, a celebrated lithotomist, was a doctor of *Padua*. *Marcus Aurelius Severinus*, *Vigo*, *Fabricius ab Aquapendente*, *Cæsar Magatus*, *Marchetti*, and many other practical surgeons, that might be enumerated, were doctors of physic. *Monf. Le Cat* at
Rouen,

Rouen, and *Monf. Pouteau* at *Lyons*, chief surgeons to the great hospitals in those cities, are styled doctors of physic and surgery. The late illustrious *M. De La Peyronie*, who was first surgeon to the king, and to whom the whole faculty is greatly indebted, was bred, and took a doctor's degree in the university of *Montpelier*. Some of the physicians to the kings of *France* were originally surgeons, in which country singular marks of royal favour have, for many ages, been conferred upon surgeons, as we have observed; and by a late edict, upon the establishment of the Royal Academy of Surgery at *Paris*, no surgeon is allowed to practise, and be master of his company, without having taken a master of arts degree in some university of that kingdom.*—The great *Fabritius Hildanus*, who flourished in the 15th century at *Bern* in *Switzerland*, was physician and surgeon in ordinary to that illustrious republic, and to the marquis of *Baden*. He stands at the head of the first class of observators, and should be in the hands of every practitioner.

Though

* See *Histoire de l'Origine & de Progrès de la Chirurgie en France*; wherein great encouragement for the improvement of surgery appears to have been given by royal edicts, in different ages,

Though in a strict and limited sense, the art of surgery is considered, only as a methodical application of the hand and instruments, and physic and surgery are now distinct professions, yet the latter, having for it's objects of attention all external disorders, it is absolutely necessary for the surgeon to be acquainted with the laws of the animal œconomy,* and every thing relative to the medical art, to acquit himself the more properly in his department: and a good knowledge, in the rules and theory of surgery, is no inconsiderable addition to the character of a regular physician, to whom all deference should be paid, without servility. In the very nature of things, both branches of medicine are so connected, that they cannot be separated without manifest injury, according to the sentiments of *Celsus*, who says; “ *Omnes medicinæ partes ita connexæ sunt, ut ex toto separare non possunt.*” In another place he delivers himself thus; “ *Ergo eundem quidem hominem posse omnia ista præstare concipio; atque ubi se dividerunt eum laudo qui quamplurimum precipit.*” *Lanfranc* says, “ *Nul ne peut etre bon medicin s'il n'est chirurgien, & nul n'est bon chirurgien s'il n'est medecin.*” Influenced

* In respect to the animal œconomy, baron Haller's *Primæ Linæ Physiologicæ* may be read with great advantage, and also Boerhaave's *Institutiones Medicæ*.

enced by these authorities and considerations, I shall not confine myself, in the following treatise, to manual operation and topical remedies only ; but give some general instructions, in respect to regimen and internal medicines, as far as it appears essentially necessary, for the practitioner's own satisfaction and his patients' benefit, as the surgeon cannot always have the advice and assistance of the regular physician, when he stands in need of such advantages, either from distance of situation, or other circumstances.*

Hence we see how requisite it is for a surgeon to make himself as well acquainted, as he possibly can, with every part of the medical art ; more especially with anatomy, in order to fulfil the duty of his profession : and in *London* now no opportunities are wanting to favour all such pursuits. Besides these qualifications, and those recommended by *Celsus*, as a strong, steady hand, a clear sight, with calmness and fortitude of mind, &c. it is incumbent upon the surgeon, to weigh well and consider circumstances and incidents, that may possibly occur, in any considerable operation he is
about

* Baron Van Swieten's Commentaries upon Boerhaave's Aphorisms, furnish us with a plentiful stock of useful knowledge, in the theory and practice of physic and surgery, and should be read with the utmost attention.

about to perform, that he may not be disconcerted, should any thing extraordinary happen in it. It is also a matter of no small consideration, to engage the patient's confidence in us, by showing him the reasonableness and propriety of what we propose for his cure or relief: and we should endeavour to ingratiate ourselves into his favour and opinion of us, by all the demonstrations of tenderness and humanity the nature and circumstances of the case will allow, which conduct will the most effectually compose and settle his mind, enabling him to bear, with the greater patience and resignation, whatever he must unavoidably suffer.

Before we undertake the cure of a disease, by manual operation, or otherwise, it is necessary to be thoroughly acquainted with it, and to have a due regard to the patient's age, sex, constitution, customary way of life, and disposition of mind. We must particularly inquire into the source of the distemper, consider it's nature, the part affected, the effects it has produced, and the probable event, with every other circumstance to direct our judgment: and, after having fully possessed ourselves of the *diagnostics* of the disease, we are to proceed to the *prognostics*, with great care and circumspection, as it is a very nice point to manage, both in respect to the patient, and our own reputation.

reputation. Lastly, we are to put in practice the easiest, safest, and most expeditious method of cure, remembering, by all means, that when an operation is judged expedient, due preparation before, with great care and attention after it, is as essentially necessary to secure its success as performing it well. The surgeon should studiously avoid being in a hurry, in any operation; for by endeavouring to gain the character of a dexterous operator, he may, through quickness, cut parts that ought not to be touched, or omit doing what ought to be done. This rule of a very wise professor, deservedly held in the highest esteem, should ever be borne in mind. “*Sât citò, si fât benè.*” which is applicable to all operations in surgery; the excellence, or gracefulness of performing them, not consisting in the greatest quickness altogether: and there is scarce any accident, or difficulty, that can happen, which may not be overcome, when the operator is master enough of himself to preserve a composure and presence of mind; but when the contrary is the case, and the mind is disconcerted, the hand of course will shake and the judgment falter; which unlucky circumstances, when observed, may greatly prejudice the reputation of an able surgeon.

O F T H E

RISE, PROGRESS, AND PRESENT STATE

O F

A N A T O M Y.

AFTER having written the introduction, and following treatise, some reasons occurred to my mind, which upon imparting to my friends, induced them to think with me, that, before entering upon our subject, a transient view of the rise and progress of anatomy also, with a short historical account and character of some of the most conspicuous men, successively concerned in the advancement of that science, might not prove unacceptable, or quite an unprofitable amusement to the young gentlemen, for whose sake I adventure to write. Indeed anatomy is so closely connected with the profession of surgery, and so fundamentally necessary to be understood,

that no exhortation or incentive can be really wanting, to enforce an early and assiduous application to this most entertaining part of natural philosophy, superior to every branch of it, for dignity of subject and utility to mankind.*

Not to interrupt the order of this abstract history of anatomy, I shall be obliged to repeat some incidents and circumstances, that have been before mentioned in the introduction.

As we have already observed in the introduction, bloodshed and wars were early practised in the world; consequently surgery was coëval with it's necessity; and hence we may reasonably infer, that those who were conversant in curing wounds, and other external injuries, soon made some useful anatomical discoveries and remarks, there being in the mind of man a strong propensity and inquisitiveness, to improve his knowledge in all things necessary to life, more especially those of such importance, as tend directly to his own preservation, and very existence.

As

* Read the great doctor Charleton's preface to his Anatomical Lectures, delivered at the theatre of the illustrious College of Physicians in London, immediately after it was erected, by the munificence of sir Thomas Cutler, who was an exemplary patron of learning and learned men.

As the practice of embalming dead bodies was much in use among the *Egyptians*,* it is no unreasonable supposition, that those who exercised this art might make some anatomical remarks applicable to surgery, even before the *Greeks* were renowned for their skill in arts and sciences, for which they were originally indebted to the *Egyptians*: and upon the authority of *Pliny*, we may say opening dead bodies was sometimes practised in *Egypt*, and even encouraged there by the wisest kings and princes, in order to investigate the nature and cause of diseases and death.†

We shall begin with *Æsculapius*, whom historians say, as we have related before, was the son of *Apollo*, and had *Chiron* for his master, a great philosopher in those days, well skilled in the sciences and the medical art, who dwelt upon mount *Pelion* in *Thessaly*, where the great men used to resort to him for instruction, according to *Clemens Alexandrinus*. *Galen* says, *Æsculapius* much improved the medical art, particularly surgery, or the treatment of external disorders, which was then in the greatest esteem, as it's usefulness came

C 2

more

* Vid. Diodor. Sicul.

† See Rider's notes upon the last chapter of *Genesis*, relating to the ancient manner of embalming among the *Egyptians*.

more immediately under the evidence of the senses ; and undoubtedly he acquired some practical knowledge in anatomy, though there were no regular professors of that science in his time. For his reputed great skill in his profession, he was deified, and had temples consecrated to him at *Epidaurus*, *Pergamus*, *Cos*, and other parts of the world, which were much frequented in those days ; and the priests, who had the superintendence of these sacred, oracular places, very well knew how to impose upon the credulous, to their own emolument and advantage.*

Machaon and *Podalirius*, the sons of *Æsculapius*, were celebrated for their superior skill in surgery, when they attended the *Trojan* war, under the conduct of *Agamemnon*, and consequently they must have acquired some practical anatomy. *Homer* himself, who has recorded their actions, as soldiers, as well as surgeons, was also a great philosopher, and appears to have been theoretically

* In the time of a raging pestilence, the Romans having consulted the oracle of Apollo at Delphos, to know what they should do in that calamity, fetched *Æsculapius* from *Epidaurus* where he was chiefly worshipped ; and on this occasion he had a temple built by them, in an island near the mouth of the *Tiber*, and dedicated to him, as *Ovid* informs us.

cally acquainted with surgery and anatomy, by his descriptions.

Le Clerc says,* from *Pausanius*, that *Machaon* married *Anticlea* the daughter of *Diocles*, king of *Messenia*, by whom he had two sons, *Nicomachus* and *Gorgasus*. They enjoyed their grandfather's dominions, till they were expelled by the *Heraclides*, descendents of *Hercules*, who sat up a prior claim, their progenitors having been lords of *Peloponnesus*.

Podalirius, in his return from the *Trojan* war, upon the authority of *Stephanus Byzantinus*, was shipwrecked upon the coast of *Caria*, and preserved by a shepherd, who, understanding he was skilful in curing diseases, carried him to king *Damæthus*, whose daughter he cured of a mischief received by a fall; which happy event highly pleased the king; and after he was acquainted with his history and extraction, he gave him his daughter in marriage, with the *Chersonese* for her portion, where he built two towns, calling the one *Syrna*, which was the name of his wife, and the other *Bybassus*, the name of the shepherd who saved his life after his shipwreck.†

C 3

From

* Histoire de la Médecine.

† It is said he cured the princess by bleeding on both arms; and that this is the first instance of the practice of phlebotomy which is to be met with.

From the conclusion of the *Trojan* to the *Pe-
loponnesian* war, an interval of more than seven
hundred years, the *Asclepiadæ*, as we have before
intimated, were almost the only people who dis-
tinguished themselves in the medical art. They
established schools for the study and improvement
of this science, in different parts of *Greece*, which
spread the knowledge of it into distant countries :
and we are told, with good authority, that ana-
tomy was so peculiar an object of their notice and
attention, that they used to teach their children
to dissect brutes from their infancy.

The native country of *Pythagoras* is uncertain ;
some say he was a *Tyrian*, others a *Syrian*, and
some that he was born at *Samos*. To increase his
knowledge, he travelled into *Egypt*, to *Babylon*,
Chaldæa and other parts of the world, famous for
arts and sciences, though now depopulated, and
fallen from their ancient glorious state, over-
whelmed with barbarism, and sunk into abject
slavery. At his return from his travels, he
came to *Samos*, intending to make that city the
place of his residence, but not being able to en-
dure the tyranny of *Polycrates*, he fled from
thence, and dwelt at *Crotona* in *Italy*, where he
was the founder of a school for the study of
physic. He was the first that joined philosophy
to

to the study of that science; a man of great abilities and application; and it appears, that anatomy was not disregarded by him. He flourished in the time of *Tarquin* the last king of *Rome*, became very illustrious by his learning, virtue, and persuasive eloquence, and died full of years and full of glory.

Empedocles was one of *Pythagoras's* brightest scholars, a *Sicilian*, born at *Agrigentum*. He was an eminent physician and philosopher, and understood anatomy; and, I think, *Lucretius* mentions him both as a poet and an historian. There are various opinions concerning the manner of his death; some say, he threw himself into mount *Ætna*, others, that he was drowned in the sea, but no valid authority appears to prove the truth of either of these catastrophes.

Alcmæon was by birth a *Crotonian*, became a physician of great fame, and applied himself much to anatomy; in his philosophic principles he was a *Pythagorean*.

Democritus was an eminent physician, and one of the greatest philosophers of antiquity. If *Abdera* in *Thrace* was not the place of his nativity, it was undoubtedly that of his residence. He had such an insatiable passion for learning, and all the sciences, that he spent great part of

his patrimony in pursuit of knowledge, incurring the censure of the state for prodigality, on that account. He travelled into *Egypt*, *Persia*, and the remotest parts of the earth, making himself acquainted, and conferring personally with philosophers and physicians, the magi, gymnosophists, &c. renowned for learning in those days. He dissected brutes, in order to discover the seat of the bile; and in his philosophic notions was an atomist and a vacuist.

The people of *Abdera* apprehended *Democritus* was grown mad, because he delighted in retirement, and was always laughing at the follies and vanities of the world; but still having the greatest veneration for him, they sent for *Hippocrates* to come and cure him of the supposed insanity of his mind. *Hippocrates* found him engaged in dissecting brutes, and asking him why he did so, he said it was to discover the seat and nature of the bile, a predominance of which humour, he conceived, was the cause of madness; which rational answer began to make *Hippocrates* think those who sent for him wanted hellebore more than *Democritus*; and after having had a long conference with him, he was fully convinced of the sanity of his mind, and declared him not only perfect

perfect in his intellectual faculties, but that he believed him to be one of the wisest men in the world. In all probability, this interview laid the foundation of an inviolable friendship between these illustrious men, who held an epistolary correspondence afterward. He lived to be more than one hundred years old, and bore the misfortune of losing his sight some time before his death, like a divine philosopher.

Damocrates was an eminent physician, and said to have had the honour of being *Hippocrates's* master in anatomy; but he was soon excelled by his scholar.

Hippocrates was born in the isle of *Cos*, about thirty years before the *Peloponnesian* war, and between four and five hundred before Christ; and was educated at the school, established by the *Asclepiades*, in the city of *Cos*, the metropolis of that island. He was the eighteenth in descent from *Æsculapius*; his father's name was *Heraclides*, and he was of as noble extraction by the mother's side, who was of the lineage of *Hercules*. Besides the advantages he reaped by his father's early instruction, he was under the tuition of *Herodicus*, an eminent physician, who first introduced gymnastics in the cure of diseases, as
well

well as in the prevention of them ;* he was also pupil to *Gorgias*, brother to *Herodicus*, a famous rhetorician and philosopher. This great luminary eclipsed all that rose before him ; he wrote much upon the structure of the human body, and was the greatest physician, surgeon, and anatomist of his own time.

Hippocrates's fame was so great, when the plague raged, and made dreadful devastation in *Persia*, that *Artaxerxes* sent for him in the most pressing manner, to assist his distressed country, offering to load him with riches and honours ; but he refused to go, as he had done before to the *Illyrians*, in the same calamitous state, though they also offered him the greatest rewards, apprehending his own country might want his assistance. He went himself to advertise the *Athenians* of what was to be feared, from his observations in respect to the winds, and other circumstances, advising them what steps to take, in order to avert the impending danger.

When

* The Persians, the Greeks, and the Romans, wisely instituted various kinds of games and bodily exercises, to strengthen the constitution and prevent diseases ; as well as to render their people active and better fitted, by athletic exercises, for all martial exploits.

When *Hyftanes*, governor of the *Hellefpont*, wrote to *Hippocrates*, by his mafter's command, in an imperious ftyle, promifing him the greateft rewards of riches and honour, to tempt him to go, he was much difpleafed, and answered in thefe terms.—“ *Viftu et veftitu, & domo, & omni*
 “ *ad vitam fufficienti opulentia fruimur; Perfarum*
 “ *autem divitiis uti, fas mihi non eft: neque barbaros*
 “ *homines a morbis liberare, qui hoftes funt Græco-*
 “ *rum.*” This answer incended the king fo much, that he denounced utter ruin and deftruction on the people of *Cos*, and that he would lay their country wafte, if they countenanced fuch infolence; but thofe brave and generous iflanders, replied with a becoming fpirit and refolution, to the menaces of that mighty earthly prince, who haughtily ftyled himfelf king of kings, declaring they would protect fo worthy a citizen, and fo virtuous a man, and not deliver him up to his chaftifement, let what would be the confequence of his resentment.

From a juft fenfe of his probity and integrity, his unshaken conftancy, his attachment and love to his contry, and the *Greeks* in general, in refifting fuch powerful temptations; and in confideration of the regard he had paid to the *Athenians* in particular, the fenate decreed that he
 fhould

should be presented with a golden crown, and have all the honours that *Athens* could give, conferred upon him: and for his sake, the youth of the isle of *Cos* were invited to receive their education at *Athens*, with the youth of that university, then in it's flourishing state, and distinguished throughout the world, for being the seat of the liberal arts and sciences, and all polite literature; now miserably changed to ignorance and barbarism. Strange vicissitudes in all sublunary things!—The perfections and eminent virtues of this venerable man, consecrated him to immortality, and placed him among the divinities, after living more than one hundred years in the greatest repute and glory.

Hippocrates left two sons, *Theffalus* and *Draco*, who followed the profession of their father, but fell far short of his reputation and excellence. *Theffalus*, the eldest of them, was most known in the world, and spent the greatest part of his life in the court of *Archelaus*, king of *Macedonia*. There is an oration of his to the *Athenians*, at the end of the works of *Hippocrates*. Nothing memorable appears of *Draco*, only that his son, of his grandfather's name, was physician to *Roxana*, *Alexander's* favourite mistress.

Polybus

Polybus was one of *Hippocrates's* most celebrated disciples, and married his daughter. After the death of his father-in-law, he undertook the instruction of his pupils; and acquired great reputation in his profession.

Plato, called the divine philosopher, was a great metaphysician, and chief of the academies. He followed the steps of his predecessors, joining philosophy to physic. His notions concerning the spinal marrow, the brain, the heart, the action of respiration, &c. entitle him to be classed among the anatomists. He was born at *Athens*, and brought up under *Socrates*.

Diocles was a physician of the greatest distinction after *Hippocrates*; the *Athenians* called him the second *Hippocrates*; and *Galen* says, that none before him dissected and displayed the parts so well.

Praxagoras was a famous physician, a native of the isle of *Cos*, as well as *Hippocrates*, and of the the same family; the last of the race of the *Asclepiadæ*, who excelled in his profession; and he was considered as a great anatomist in his time.

Philotimus, *Eudemus*, and *Plistonicus* were disciples of *Praxagoras*. *Galen* gives the first the character of a good surgeon; and says the second was an accurate anatomist, particularly in respect

to the nerves. *Celsus* speaks of the third, but not in very advantageous terms, concerning his notion of the digestion of the aliment in the stomach.

Aristotle was a native of *Stagyra*, a small city in *Macedonia*, born about four hundred years before our Saviour. He studied under *Plato* at *Athens*, was one of his most shining scholars, but gave his master much offence, by opposing his doctrine; and afterward he became the head of the *Peripatetics*. He had great opportunities of improving his genius, under the patronage of *Alexander* the Great, who was his pupil. He was considered as a physician, as well as a great philosopher, and by his writings it appears he paid attention to anatomy; but entertained some odd notions, in respect to physiology, and the use of many parts of the human body.

Herophilus and *Erasistratus* were celebrated physicians, and professors of anatomy at *Alexandria*, after the death of *Alexander* the Great. It is said, they dissected a great number of human bodies, and were accused of opening some alive, to discover the motion of the heart, &c. They made many anatomical discoveries; and *Fallopianus*, who was an eminent professor at *Padua*, was so great an admirer of *Herophilus*, as to declare,
he

he would as soon contradict the gospel as *Herophilus*.*

According to *Galen*, the schools established by these great men, and their disciples, were long in high repute; and *Strabo* testifies, that near his time there was a school of *Herophilians*, in *Phrygia*, in which *Zeuxis*, a man of great note, presided, who was bred under *Herophilus*.—About the same time, there was also a school of *Erasistratus*, at *Smyrna*, of which *Hicesius* was master, who had the character of being one of the greatest physicians of those days.—Hence we may justly conclude, that the students in these seminaries were taught anatomy: and as *Herophilus* and *Erasistratus* were professed and celebrated anatomists, it is very reasonable to suppose the disciples of such eminent professors should imbibe their principles, follow their precepts, and daily study to make improvements, for the benefit

* *Herophilus* was one of *Praxagoras*'s pupils, and *Erasistratus* was educated under *Chrysippus*, whom he far excelled. They might reasonably be looked upon as better anatomists than their predecessors, having had bodies of malefactors delivered to them by the order of *Ptolemy Soter* and *Philadelphus*, founders of the *Alexandrian Library*, to be dissected for the improvement of anatomy, &c.

nefit of those that might come under their instruction.

Serapion and *Philinus*, and many other physicians of eminence, were of the empirical sect, so called for relying upon practice and experience only, in the acquirement of medical knowledge, without introducing philosophy into the study of it. They were educated under *Herophilus*, at *Alexandria*, consequently acquainted with anatomy ; so was *Heraclides*, of *Tarentum*, a famous empiric, who was also reputed a very skilful surgeon.

Apollonius, of *Memphis*, now *Grand Cairo*, the capital of *Egypt*, and many physicians of eminent character there, were scholars of *Erasistratus*, and wrote upon anatomical subjects, as we are told by the learned, though their works have perished through time.

In the declension of the *Grecian* empire, when the *Romans* had made large strides towards universal monarchy, and *Rome*, in great splendour and magnificence, became the seat of universal learning, arts, and sciences, which the *Greeks*, unrivalled, had long and gloriously cultivated at *Athens*, *Arcagathus*, a *Peloponnesian*, came and resided at *Rome*, in the consulate of *Lucius Æmilius* and *Marcus Livius*, and after him some other

Greck

Greek physicians; but their practice and conduct proving very displeasing to the *Roman* people, some writers have imagined, they were banished the city on that account, by a decree of the senate, promoted by *Cato*; however, that event is not supported with incontestible evidence, though it is very certain *Cato* entertained an aversion to the *Greeks*, and approved the medical art, as it had long been practised at *Rome*, in great simplicity, rather than be obliged for improvement of it, to those whose morals offended his rigid virtue.

Till the time of *Julius Cæsar*, this art was not patronised and encouraged at *Rome*, like other arts and sciences; but by an edict of that emperor, foreigners, particularly the *Greeks*, they being most skilful in physic, were invited thither, and promised they should be made denizens, enjoying all the privileges and immunities of *Roman* citizens; which invitation and fair prospect of accruing advantages, brought many great men to the metropolis of the world, raising a spirit of emulation in the native *Romans*, to prosecute medical studies, who afterwards made a shining figure in their profession, and were much in favour with the emperors, and people of the highest rank and character for learning, as we are well informed

from history : and the indignity that some historians have cast upon the *Roman* physicians, seems not well founded.

About one hundred years after *Arcagathus*, who was the first *Grecian* physician that left his native country, and came to practise at *Rome*, *Asclepiades* settled there, following the example of his countrymen, with a view of making his fortune better than at home. He was called a dogmatist, because he joined reasoning to experience, in opposition to the empirical sect, which admitted only of experience, as the solid basis to build medical science upon. He was a native of *Prusa*, in *Bythinia*, which is indebted for its numerous pleasant rills and fountains to proud *Olympus* aspiring to the clouds ; and near this city too are the celebrated baths of *Calypso*, much resorted to for their salubrious virtues. Upon his arrival at *Rome*, he first taught rhetoric, which scheme not answering his expectations, he turned his thoughts to physic, having studied it at *Alexandria*, and soon acquired great reputation and esteem in his new profession, by treating his patients in a gentle manner, and more agreeably to their own humours, departing from the severe and rigid rules of his predecessors, allowing them wine and other indulgences. By his complacency and superior
under-

understanding, he gained the hearts of the people so much, that he was adored, and compared to *Hippocrates* himself, and had a marble bust erected to perpetuate his memory. He was considered by the literati at *Rome* as a very learned and eloquent man, as well as an eminent physician; much admired by *Cicero*, who called him his friend, an honour that gave him more pleasure than the favour of king *Mithridates*, who was a great patron of medical men, and having a high opinion of this illustrious man's abilities in his profession, invited him to his court; but he resisted the most powerful temptations of that prince. He entertained some singular anatomical and physiological notions; but had a great many disciples and followers, till the methodical sect sprung up, of which we shall take notice presently. There were several physicians of high character his contemporaries at *Rome*, with whom he lived in great amity.—*Antonius Musa*, *Augustus*'s favourite physician, who flourished many years after, and had a statue erected to immortalize his name, near that of *Æsculapius* at *Rome*, was a great admirer of *Asclepiades*, to whom he acknowledged himself much indebted.*

D 2

Cassius

* Read bishop Atterbury's beautiful dissertation upon *Antonius Musa*'s character, represented by *Virgil* in the person of *Japis*.

Cassius, a man of great repute, succeeded *Asclepiades*. He is spoken of as one of the most celebrated physicians of the age in which he lived. He was bred under *Asclepiades*; but in his latter days dissented from some of his master's tenets. He understood surgery, assigned reasons for round ulcers healing with more difficulty than those of an oblong or angular figure; and he was of opinion, that the opposite side becoming paralytic, in an injury of the brain, was owing to a decussation of the nerves; but that is not allowed an anatomical fact; nor is the effect inviolable, though the opposite side is more generally so affected, as experience evinces. *Galen*, and *Scribonius Largus*, physician to *Claudius*, mention him in advantageous terms. That emperor studied physic, and was a great patron of the professors of it: and in his reign also lived *Alcon*, a famous surgeon and anatomist, called by *Pliny*, *Medicus vulnerarius*, who acquired an immense fortune by his practice.

Themison was a *Laodicean*, a disciple of *Asclepiades*, and founder of the methodical sect, so called from proposing a method to render physic more easy to be learnt and practised, without joining philosophy to it; and the practice of the physicians of this sect consisted principally in abstemiousness

temiousness and slender diet. This physician practised at *Rome*, towards the conclusion of the reign of *Augustus*, or beginning of that of *Tiberius*. This sect had great affinity to the empirical, established by *Serapion* two hundred years before, with the same view of facilitating the study and practice of physic; and in those days empiricism was seen in no contemptible light. *Themison* had many favourers and admirers of his doctrine, as well as *Serapion*; the most considerable of the methodists after *Themison*, was *Soranus*, an *Epheſian*, who was educated at *Alexandria*, and afterwards resided at *Rome*, in the time of *Trajan*. *Cælius Aurelianus* makes honourable mention of him; and there is some reason to believe he translated his works into Latin, or at least copied much from them. *Aurelianus* was esteemed a good anatomist, by birth a *Numidian*, a resident and practitioner at *Rome*; but at what time is uncertain.

After the methodists, the episynthetic, the eclectic, and the pneumatic sects sprung up, and had many adherents. The first united the sentiments of the three preceding: the second chose what they judged best from each of them; and the third was so called, from supposing that an

ethereal spirit or air entered all bodies, possessing space universally.—*Leonides*, of *Alexandria*, was an episynthetic. *Archigenes*, a native of *Syria*, and a practitioner at *Rome* in the time of *Trajan*, an eclectic. *Atheneus*, a famous physician, by birth a *Cicilian*, embraced the pneumatic system. *Aretæus*, the *Cappadocian*, was also a favourer of the pneumatic doctrine. He was an excellent writer; but it is not precisely known in what time he lived, though it is generally thought to have been in the reign of *Vespasian*, and that he was contemporary with *Pliny*.

All these sects paid regard to anatomy.

Aurelius Cornelius Celsus was a native of *Rome*, according to some, and others say, of *Verona*. He was a physician, surgeon, and anatomist, of the highest character in his time, styled the Latin *Hippocrates*, and has ever been held in reverential esteem. Under what emperors he lived, is a matter of doubt among the learned; most are of opinion, and indeed it is highly probable, that he was born in the reign of *Augustus*, and wrote in that of *Tiberius*. His style is the most elegant and admired of any of the *Roman* physicians, but seems rather too elegant and concise for medical science. He confesses himself greatly indebted to
Asclepiades,

Asclepiades, as well as to *Hippocrates*, for his knowledge in his profession.*

Ruffus Ephesias flourished in the reign of *Trajan*. *Galen* honours him with the character of one of the most considerable physicians in his time. He attempted to give a general idea of anatomy, and has clearly described the spermatic vessels, and those running to the *ovaria*: hence it is not improbable, that the *tubæ fallopianæ* might be a discovery of his too, though ascribed to *Fallopious*. Apes were commonly the subjects for dissection in those days at *Rome*, it being very difficult to get human bodies there, for that purpose, though undoubtedly they were sometimes procured.

Claudius Galenus was an *Asiatic*, born at *Pergamus*, a city famous on many accounts, especially for the temple dedicated to *Æsculapius*. His father's name was *Nicon*, a man of distinction, versed in arts and sciences; he instructed his son very early himself, and spared no pains or expence in his education, procuring him the most able and learned masters, in every branch of literature. His mother was a notable economist,

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but

* Vid. Aurel. Cornel. Celsi vitam à Rhodio conscriptam. It is prefixed to Almeloveen's edition of Celsus. Et Histoire de la Médecine, par Mons. Le Clerc.

but too much a *Xantippe* for his father's peace. After having finished his academical studies, he became a very great traveller, in pursuit of knowledge, and when he returned from his travels, he dwelt some time at *Alexandria*, where he had been educated. At twenty-eight years of age he removed to *Pergamus*, and was driven from thence at thirty-two, by a popular sedition, and went to *Rome*, with an intention to fix his residence in that imperial, attractive city, where arts and sciences were cherished and cultivated. There he met with signal marks of favour and esteem, from people of the highest rank and character; but this distinction raised him many enemies in the faculty. The envious treatment, which his superiority occasioned, made his situation so disagreeable and uneasy, that after having dwelt four or five years at *Rome*, he returned to *Pergamus*. Soon after that, *Marcus Aurelius* and *Lucius Verus*, generals of the *Roman* army then at *Aquila*, hearing of his great fame, sent an express for him, and he attended the former of these great personages to *Rome*, the other dying in his return home. *Galen* having then the good fortune, shortly after his arrival at *Rome*, to cure *Sextus*, one of the sons of *Marcus Aurelius*, predicting the event of his disease, contrary to the opinion of
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the other physicians concerned, his reputation was highly exalted. This happy presage made him considered as the greatest physician of his time; and his excellence in surgery, which he also practised, is manifest in many instances. But great men have their foibles; he entertained superstitious notions, was full of ambition, quick of resentment, too sensible of injuries, as we have seen; and remembering, with some indignation, the detraction and malevolence he received from his brethren before, he laid hold of the advantage his popularity now gave him, to show his resentment of former indignities, which effectually silenced his enemies. He was an excellent orator, and the best anatomist that had ever been at *Rome*: many persons of the highest distinction honouring him with their presence at his lectures and demonstrations, popular prejudices were in a great measure removed, and the *Roman* people in general better reconciled to anatomy. He wrote his book *de Ufu Partium*, the most admired of all his works, at the desire of *Lælius*, his friend and patron, a man of consular dignity. In all probability at *Rome* he might find difficulty in procuring human bodies for dissection; yet that he did dissect such, as well as apes and other animals, is very evident from his own writings,

ings, notwithstanding that some writers have suggested to the contrary. I have read that the physicians and surgeons, who attended *Marcus Aurelius* in the *German* war, were allowed to dissect enemies bodies slain in battle; and that this extraordinary man had the like indulgence granted him, in the expedition he attended into *Gaul*. He made many useful discoveries and remarks, assumed by succeeding anatomists, of which they availed themselves. His physiological and medical notions were implicitly followed for many ages, and the *Arabians* were much indebted to him for their reputation in the world. He was a very voluminous writer, and employed his pen upon various subjects, besides what related peculiarly to his profession. Many of his books were deposited in the Temple of Peace at *Rome*, and destroyed when that was burnt.*

Lucius Apuleius lived at the same time with *Galen* at *Rome*. He was an *African*, born at *Madaura*; his father's name was *Theseus*, a man of great account in his country, and his mother was related to *Plutarch*. He studied first at *Carthage*, and then at *Athens*, and followed the profession of
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* Though *Galen* was a pagan, yet he acknowledged in his excellent book *de Ufu Partium*, one God and his attributes; and opposed the *Epicurean* system and doctrine.

the law for some years after he came to *Rome*: and being a man of extraordinary talents and elocution, gained great applause at the bar, yet quitted it for physic. He was a great admirer of *Plato*, followed his example in joining philosophy to that science, considering that theory and practice united were necessary qualifications for a physician: and he arduously pursued anatomical inquiries.

Oribasius, *Alexander Trallianus*, *Ætius*, and *Paulus Ægineta* were great writers, but chiefly compilers, and may be considered as anatomists. *Paulus* was the last of the *Alexandrian* school.

The time when these eminent men lived and wrote cannot precisely be determined, but, according to the learned doctor *Friend*,

Oribasius was born at *Pergamus* as well as *Galen*, and educated in the school of *Zeno* the *Cyprian*, at *Sardis*, who was a founder of the *Stoical* sect. He was considered as the greatest scholar and physician of his time, and of a very engaging address. He wrote about the middle of the fourth century, and dedicated his works to the emperor *Julian*. He practised and died at *Constantinople*.

Ætius was born at *Amida*, in *Mesopotamia*, educated at *Alexandria*, and wrote towards the conclusion of the fifth century. He has some things
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not to be found in his predecessors; and wrote with great perspicuity.

Alexander Trallianus was born at *Tralles*, a city of the *Lesser Asia*, lying between *Caria* and *Lydia*. He made a great figure at *Rome* in the reign of *Justinian*, in the sixth century. He was called, by way of eminence, *Alexander the Physician*. He compiled his works, as he says himself, in an advanced age.

Paulus Ægineta succeeded *Alexander*. He flourished in the seventh century, and excelled all the others in point of surgery.

The works of these illustrious *Grecians* were translated into *Latin* from their native language, by *Rasarius*, *Cornarius*, and *Guinterius*.*

Under the conduct of the caliph, as we have before observed, the *Saracens* took *Alexandria*, A° Cⁱ 640, destroyed the university, and burnt the library, which was the greatest repository of learning in the world.—Soon after the destruction of this famous university, learning sprung up in *Arabia*; and from that time to the 13th century, the *Arabians* were almost the only people who cultivated the medical art; and, in all probability, some books fell into their hands, saved
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* Vid. *Medicæ Artis Principes post Hippocratem & Galenum*.

out of the flames.—In the same century too, as we have mentioned, the irruption of the *Goths* and *Vandals* proved greatly detrimental to learning of every kind in *Europe*.—*Rhazes*, *Avicenna*, *Avenzoar*, *Averrhoes*, and *Albucasis*, were the most noted among the *Arabian* physicians who wrote upon surgery also, as has been said; but their anatomical descriptions were borrowed from the *Greeks*; for a superstitious notion prevailed with them, as with the *Jews*, that touching a dead body defiled the living.

After the fall of *Alexandria*, universities were opened in several parts of *Europe* for the study of physic, which, from various concurring causes and circumstances, made a very slow progress for many ages; but about the 13th century, learning began to spring up, and medical art to flourish.

Mundinus was an eminent professor at *Padua* in this century, whose compendium of anatomy was appointed, by the laws of that and other universities in *Italy*, to be used as the text-book, for the professors to comment upon, and continued in that great credit for near three hundred years. Early in the 15th century, *Alexander Achillinus*, a *Bononian* professor, and his brother *Philotheus*, improved it; soon after, *Berengarius*, styled the
Italian

Italian Hierophilus, wrote large and learned commentaries upon this book, and so it stood in use, till the time of *Morgagni*, the late most celebrated professor of anatomy at *Padua*. *Mundinus* was thought to be better acquainted with the structure of the lungs, than any anatomist before him. He understood the distribution of the nerves; and he described the *pancreatic duct*, though *Virfungus*, one of *Vesalius's* pupils, has the honour of that discovery.

Arts and sciences met with signal marks of royal favour and patronage in *France*, for many successive generations: and since the establishment of public lectures at *St. Côme*, for the improvement of surgery and anatomy, that kingdom has produced many excellent anatomists and surgeons.

About the middle of the 14th century, *Constantinople* was taken by *Mahomet*, who studied to suppress literature, and keep his subjects in ignorance, from political views. Upon this revolution the *Greeks* fled, and carried their books, as their penates, to the west, where the plagiarism of the *Arabians*, in respect to the *Greeks*, was discovered enough to bring them into some disrepute.

Alexander

Alexander Benedictus wrote towards the conclusion of the 14th century, who made many discoveries, ascribed to more modern anatomists.

Writers in the 15th century.

Jacobus Berengarius Carpensius, sometimes called *Jacobus Carpus*, was a professor of great repute in the beginning of this century at *Bononia*, now *Bologna*, the most noted university in *Italy*; and he appears to have been the first who published anatomical plates or figures, which were cut in wood in those days, not in brass or copper. He dissected a great number of human bodies, and a clamour was raised against him, as against *Herophilus* and *Erasistratus* near two thousand years before, upon a suspicion of opening some of them alive. The description of the *papillæ renum*, given by *Massa*, *Fallopianus*, and *Bellini*, was his. The pellicle in the middle of the *scrotum*, or *septum scroti* of *Raw*, is his discovery; but anatomists seem not yet fully agreed concerning the distinct existence of this part. He has accurately described the *vesiculæ seminales*.—It is said, that he first knew the use of *argentum vivum*, in the cure of the venereal disease; by which secret he gained great fame and wealth.—His book

de Fractura Cranii is a convincing testimony of his chirurgical abilities.

Andreas Lucchini was an eminent *Spanish* physician, educated, I think, at *Salamanca*. Anatomy very particularly engaged his attention, and he epitomised some of *Galen's* works.

Nicolaus Massa has been accused of plagiarism; he made but few anatomical discoveries, but boasts of many.

Jacobus Guinterius was an able anatomist; he gave the best description of the muscles of any before him; and says he taught *Vesalius* many things.

Joannes Fernclius was a native of *Picardy*, in *France*, probably of *Amiens*, the capital of that province. He was a man of great erudition and eloquence, much admired by the learned for the elegance of his style. He was archiater to *Henry* the Second of *France*, and did great honour to his country and his profession. He understood anatomy; it is said he discovered the *os hyoides*; but it is described in *Galen*.

Joannes Cleander was an anatomist of some note; but wrote only about the parts of the head.

Jacobus Sylvius was an anatomist of the greatest repute at *Paris*; he well described the *musculi pyramidales*,

pyramidales, the discovery of which has been ascribed to *Massa*.

Andreas Vesalius is to be considered as a great reformer of anatomy ; he was the most celebrated man of his time, and dared to contradict the received infallibility of *Galen*. He was born at *Brussels*, the capital of *Brabant*, early in the 15th century ; and, for a great many generations, his family had much distinguished themselves in the medical art. Extraordinary care was taken of his education, before he was sent to the college at *Louvain*, where he prosecuted academical studies very sedulously, and acquired great knowledge of the *Grecian*, *Roman*, and *Oriental* languages ; yet whilst he was indefatigable in these pursuits, his native passion for anatomy was ever uppermost ; even while a boy, he frequently employed his time in dissecting dogs and other animals, as a matter of amusement and diversion ; an early presage of his future greatness in that science. He visited many universities, and became intimate with the most learned men ; he diligently studied physic, surgery, and anatomy, under *Jacobus Sylvius*, at *Paris*, who excelled all his contemporaries ; but he himself publicly declared *Vesalius* excelled his master. Pursuing anatomical studies with uncommon ardour and resolu-

tion, he soon obtained the character of the greatest proficient of his time ; and his public lectures were universally admired. In the early part of his life, he wrote his *Encheiresis Anatomica*, which proved a good directory to students in those days ; the large work, that he published afterwards, is a book still in great esteem, in the plates of which, the muscles are represented bold and swelling, resembling life and action more than those of *Eustachius* ; and consequently, on those accounts, are more admired.*

Vesalius was archiater to the emperor *Charles* the Fifth, who, for a monastic life, resigned the imperial diadem to his brother *Ferdinand*, and the crown

* *Giorgio Vasari*, in his history of the painters, says, that the figures of this work were drawn and engraved originally by *Giovanni Calcar*, which relation is contradicted by the late doctor *Charleton*, in the preface to his Anatomical Lectures before the College of Physicians, wherein he expressly says, that *Lianardo Da Vinci*, a famous Italian painter, well skilled in anatomy, originally drew and cut the figures in *Vesalius's* books, and that he had seen the originals in a large folio of his in *M. S. della Pittura*, written in the Italian language, well preserved then in her majesty's cabinet at Whitehall ; but for *Boerhaave's* and *Albinus's* fine edition of *Vesalius, de Corporis humani Fabrica*, the plates were engraved by the famous Dutch artist *Wandelaar*..

crown of *Spain* to his son *Philip*; and being in the greatest degree of favour with *Philip*, and also in the highest reputation for skill in his profession, he was called to the *Spanish* court; where he cured prince *Charles*, the king's son, of a contusion on his head, after accurately and judiciously describing the cause of his threatening symptoms, by dividing the *pericranium*, when the *Spanish* physicians and surgeons had pronounced the case incurable. This happy event gained him great applause, though, at the same time, it raised him implacable enemies in the faculty at *Madrid*, seeing him so signally distinguished upon this occasion, by the king and nobility; but whilst he was enjoying this happiness, under the auspices of the king and court, having no room to envy any physician in *Europe*, the following disastrous event suddenly changed the scene. A grandee died, his patient, and he being very desirous of investigating the obscure cause of his death, begged leave of the relations to open the body, which request was granted. Some of the spectators, who probably were not *Vesalius's* friends, declared they saw the heart palpitate upon his opening the *thorax*, and possibly a tremulous motion might proceed from pressure upon the *vena cava*, or some other accidental cause; and such a slight

appearance might be aggravated by those ready to do him ill offices; however, their declaration soon reached the ears of the nobleman's relations, and raised a suspicion that the body was opened alive; in consequence of which he was prosecuted for homicide and impiety, and brought before the inquisition, where the king's authority could not save him from the rigorous sentence of that diabolical tribunal; but after long durance, through the mediation of the king and the united supplication of the court, and people in power, who were fully convinced of the injustice of his accusation, his sentence was remitted, and he obtained his liberty, upon condition of making an expiatory pilgrimage to *Jerusalem*. From thence he was called by the *Venetian* senate, and invited, in the most earnest and honourable manner, to go to *Padua*, then subject to the *Venetians*, and fill the professor's chair, vacated by the death of the great *Fallopins*; but adverse fortune still pursued this illustrious man, who, in his return from his peregrination, to atone for a pretended crime, was wrecked upon the coast of *Zant*, in a desolate part of the island, where, destitute of all support, he miserably finished his life before he was full fifty years of age, a life which seemed to merit the peculiar indulgence of heaven. His corpse
would

would have been food for the wild beasts, had not a person that knew him, happened to come by at this juncture, who, in great humanity, gave him decent burial in St. Mary's church, in the city of Zant, erecting a tomb to his memory, with this inscription.

Andreæ Vesalii Bruxellensis Tumulus

Qui obiit Idibus Octobris

Anno 1564.

Ætatis vero suæ quinquagesimo

Quum Hierosolymis rediisset.

So fell this excellent man, a sacrifice to the tyranny of merciless superstition, who in his early days was remarkably distinguished in many universities besides *Louvain*, where he was originally educated; and had signal marks of favour conferred upon him by kings and potentates, and persons of the highest character for learning; a memorable instance of which is the honour intended him at last by the noble *Venetian* senate.

Carolus Stephanus was a great proficient, and a member of the faculty at *Paris*. He says, an accident happened that kept his work from the press, by which means *Vesalius* anticipated him, in publishing some discoveries and improvements in

anatomy. He is the first, who discovered the *valves* of the *cava* and the *platysma myoides*; and *Morgagni* gives him the honour of discovering the *tunica arachnoides*.

Columbus, *Eustachius*, and *Fallopins*, were also great anatomists and rivals of *Vesalius*.

Ambrose Paré was an ornament to the *French* nation, and successively surgeon to four kings; he deserved well of surgeons and anatomists. He was providentially preserved in the massacre of the protestants in *France*, and died in an advanced age, in the year 1590.

Philippus, called the *Sicilian Hippocrates*, made but few discoveries. His works were posthumous.

Many more anatomists of distinction might be enumerated, who lived in this age; in which also, till the conclusion of it, the learned in different parts of the world, were very busy in translating the *Greek* writers in physic into *Latin*, by which means, every thing relative to the medical art, became more universally known. Among the rest, the great *Linacre*, who was physician to *Henry* the Eighth, translated many of *Galen's* works into *Latin*.*

Harvey

* Vid. Opera I. Friend M. D. de Historia Medicinæ, pag. 587 & seq.

Harvey was a famous phyfician, born at *Folkstone*, in *Kent*, and educated at *Caius* college, in *Cambridge*; after which he ftudied five years at *Padua*, and was phyfician to *Charles* the Firft. He was a great benefactor to the College of Phyficians, and died in the 80th year of his age, A. C. 1657. Thofe who are willing to rob our countryman of the difcovery of the circulation of the blood, fay, that it was known to *Servetus*, *Nemefius*, *Columbus*, *Cefalpinus*, *Arantius*, &c. but with no valid authority. The immortal *Harvey* made this important difcovery, and demonftrated the fact in the year 1628. He wrote very learnedly upon this, and many other curious and ufe-ful fubjects; and the anniversary commemoration of this great genius is an honour due to his memory, which, with his own works, will prove more durable than brafs or marble.

Spaker, of *Inspruck*, and *Remilinus*, publifhed anatomical plates, laid one over another, which, by unfolding, were defigned to fhew the parts, as they rife in diffection. It was a work of fome ufe, to give a general idea of anatomy; and doctör *Clopton Haveos*, author of *Ofteologia nova*, thought it deferved his attention enough to publifh an edition of it, with corrections and emendations: however, it is now but in little efteem:

indeed it is very inaccurate, and not to be depended upon.

The last century produced many learned and ingenious anatomists, as *Bartolinus*, *Walæus*, *Riolanus*, *Spigelius*, *Veslingius*, *Laurentius*, *Glandorpius*, *Lancisius*, *Nuch*, *Steno*, *Swammerdam*, *Diemerbroeck*, *De Graaf*, *Bidloe*, *Ruyfch*, *Van Horn*, *Pecquet*, *Afellius*, *Bellini*, *Leeuwenhoeck*, *Valsalva*, *Du Verney*, *Verbeyn*, *Cowper*, *Willis*, *Wharton*, *Havers*, *Lower*, *Lister*, *Glisson*, *Ridley*, and others: some of which treated the subject in general, and others in particular.—We are also exceedingly obliged to many celebrated men of the present age, who have given their attention to anatomy, and pursued it zealously in most parts of *Europe*, by which this science has received great improvements; and, as anatomy is more universally known, and better understood, the world must consequently have abler surgeons than in former ages.

O F

W O U N D S

I N G E N E R A L.

P A R T I.

IT is designed in the first part of this treatise, to show the nature and difference of wounds, their *diagnosis* and *prognosis*, with the general treatment of them : and in the second part, to consider them, with their treatment, more distinctly, from the head, through all the cavities, including the extremities ; interspersing histories of cases, remarks, and short anatomical descriptions, with the situation of the parts, in order to illustrate

illustrate the subject, making references occasionally from the one part to the other.*

Boerhaave's definition of a wound is the most exact, and agreeable to the common acceptation of the word. He says, that a wound is a recent and bloody solution of continuity in the soft parts, made by a hard, sharp instrument. By its character of recent and bloody, it is distinguished from an ulcer; being in a soft part, it differs from a fracture; and inflicted with a hard, sharp instrument, it cannot be confounded with a contusion; but we may farther observe, that wounds are made by obtuse, as well as incisive instruments, and by the latter, bones may receive cuts, which, with propriety enough, may be called wounds.

The human fabric is the master-piece of our great Creator's works in this sublunary world, consequently the most worthy our
contem-

* I could not well alter my original plan of this treatise laid some years ago, for a confined purpose, having then no intention of publishing these papers, which might indeed have been contracted into a narrower compass; but in the whole as it is, I hope it will not prove less instructive to those for whom it is now expressly designed.

contemplation ; and it is to be considered as the most curious *hydraulic* machine, composed of a series of pipes or vessels, of various kinds, and in every direction, having a wonderful connection, dependence upon, and correspondence one with another. It appears a plexus of vessels, with a great variety of liquors moving in them, to serve the different purposes of the animal œconomy, as far as the eye can carry us with the help of the best glasses and anatomical injections, even in the most solid parts ; and we must admit of a vascular *texture ad infinitum*, beyond all scrutinizing, but that of our reason, when it ceases to be the object of our senses, by such assistance. The fluids of an animal body, by progressive motion and mechanical powers, are joined to, and become solids, in a manner beyond our comprehension, raising our admiration, and confounding our limited faculties, unequal to such abstruse researches. The performance of all the actions and functions of the human body, depends on the due tone of elasticity and energy of the vessels, with their contained liquors of a proper fluidity and crasis circulating through them ;
and,

and in their regular and uninterrupted reciprocal actions, consist health and strength.* Hence the danger of a wound is to be considered and estimated in proportion to its size, the diameter of the divided vessels, the nature of the parts wounded, &c. as will be specified.

Superficial wounds, when well cleansed from the blood, are perceptible to the sight. The finger is better than any instrument to explore some kinds of wounds, not fully exposed to view; and a bougie is preferable to the common probe, on account of it's flexibility, where the entrance is narrow, and the course of the wound winding, intricate, and running deep; under which circumstances, to direct our judgment in the exploration of the wound, we are to inquire what attitude the patient was in when he received it, the shape of the weapon, how far it penetrated, how it was directed, with what force the blow was given, observing what kind of fluid is discharged, and every necessary appearance

* See professor Whytt's treatise on vital motions, &c. and his inquiry into the causes of the circulation of the fluids in the very small vessels of animals.

ance and circumstance for our information. The deliberate consideration of these premises, joined with a good anatomical knowledge of the parts, their actions and uses, may enable us to draw conclusions, pretty well to be depended upon, concerning the nature and character of the wound, in order to preface it's event, and direct us to rational measures in the treatment of it.

Wounds are divided into classes, as simple and compound, not mortal, and mortal. A puncture or incision, without contusion or other particular injury, is termed a simple wound; but when attended with such circumstances, it is called compound or complicated. If a part is wounded in such a manner, that the circulation of the blood is soon put to an end, it is called a mortal wound, without exception. Wounds of the cerebellum, or which penetrate the cavities of the heart, or adjacent large vessels, are of that class; and wounds of other parts, not mortal in their nature, may kill the patient, without assistance from art; though when treated skilfully, the danger may be averted. The effusion of blood from a wound of any considerable

siderable artery might destroy the patient, were no means used to restrain it, but by compression, or ligature, or some other expedient, in a part that can be come at, the patient's life may be preserved. Also wounds coming under the denomination of not mortal, may by neglect or mismanagement, prove of fatal consequence. The patient's irregularity, too tight bandage, improper applications, &c. may produce direful symptoms in simple wounds, having originally no appearance of danger.

It is proper to consider distinctly wounds of the common teguments, muscles, arteries, veins, lymphatics, glands, nerves, tendons, membranes, ligaments, &c. with their various kinds, and the effects and accidents accompanying them.—The first difference of a wound arises from the kind of weapon or instrument, and the manner of it's making the wound, whence it receives the denomination of incision, puncture, or laceration.—The second difference, of use to be taken notice of, is the figure of the wound, as rectilinear, oblique, transverse, curved, angular, or round.—The third difference is in respect to
it's

it's size, whether long or short, deep or superficial : and, when a muscle is divided, that has an antagonist, there may appear a great distortion of the parts, and the figure of the wound be much altered by that means, which is a remark worth attention. And, under this article of the difference of wounds, we may subjoin the accidents belonging to them, as pain, inflammation, gangrene, extraneous bodies lodged in them, &c. all of which will be treated of in order.

Having shown the distinction and difference of wounds, we shall take a view of them in the different parts, beginning with those of the teguments and flesh only, proceeding regularly to the most complicated.

The appearances which a large simple wound of the teguments and fleshy parts will have, in a young healthy person, when no considerable artery is wounded, from the beginning till the cure is completed, are these. In proportion as the wound deviates from a strait line, or longitudinal course, the divided parts recede, by the natural elasticity of animal fibres, which instantly shorten when the resistance to their action is removed.—Immediately

diately after the separation of the lips of the wound, an effusion of blood ensues, which gradually stops as the contractile power of the retracted vessels constricts their mouths, and the blood there coagulates. After this, the wound appears covered with a bloody crust, which is nothing but the coagulated blood, sticking in the numberless mouths of the divided vessels. Soon after a reddish serum, called gleet, which is a favourable appearance, comes trickling out; for now the mouths of the vessels are so contracted in their diameters, that they cannot transmit more blood. Then, in a little time, the lips of the wound become tumid, inflamed, re-torted, and painful, the invariable and inevitable effects of the contraction of the mouths of the vessels, with the obstruction of the fluids in the adjacent vessels, and the stricture the skin makes upon the cellular membrane; but this tumefaction of the parts, when to a moderate degree, unattended with great pain, is no unfavourable circumstance.—Now febrile symptoms supervene, and in proportion to the pain, the velocity of the blood will be increased; for pain may be considered as the
most

most active stimulus to accelerate the motion of the blood, and indeed does often make it very rapid.—On the third or fourth day, pus generally begins to appear in the wound, which is described both by *Hippocrates* and *Celsus*; and when laudable, it is thick, of a yellowish colour, like cream, having little or no smell. This formation of pus is the effect of the vital action of the vessels, by which, and the heat of the parts, when the wound is defended from the influence of the air by proper application, the effused fluids are concocted into the apparent homogenous, tenacious matter, called pus; and this operation of nature is the digestion of the wound. When this is performed, the symptomatic fever and pain generally abate; after which, the inflammation and tumefaction gradually subside and disappear, as the obstruction in the vessels is removed, and the circulation through them becomes open, free, and easy. If nothing obstructs this process of nature, the vital powers and native heat will cleanse the wound, and the extremities of the *vasa minima* or *vasa vasorum*, by the impelling force of the blood, will be stretched out;

and when there is an addition made to them, from that fluid, the extremities of these protruded vessels, elongated by little and little, give the appearance of *papillæ*.—In some of the new made vessels, from all directions, forming a *plexus* or net work, I have, with a good glass, manifestly observed pulsations, where there has been a considerable loss of substance. This generation of flesh is called the incarnation of the wound; at the edges of which carnos substance, when incapable of farther extension, or checked in it's luxuriance, it hardens, forming on it's superficies a blueish white pellicle, proceeding gradually from the circumference to the centre; and this is termed the cicatrization or skinning of the wound.

Having attended to the phenomena and progress of this wonderful operation of nature, in the generation of flesh, of which *Galen* says, “ *Cognosci debet circa carnis generationem quod materies illius sit sanguis bonus,* “ *Opifex vero & Author, Natura,*” we may proceed to describe and consider the appearances and consequences of wounds in particular parts of the body, beginning
with

with the different kinds of wounds in a small artery.

When a small artery in a limb, or any external part of the body, is totally divided, it's retraction may bring it under the surrounding parts, and with the natural contraction of the diameter of it's mouth, assisted by the compressive power of those parts, increased by their growing tumid, the efflux of blood may be stopped ; then it is to be considered only as a simple wound, as we have already described ; but when such an artery is not quite divided, only obliquely or transversely, or even longitudinally opened, it may pour out a great quantity of blood ; for when the fibres, on that side of it which is divided, recede from each other, those on the opposite side are kept firm and fixed, consequently the orifice of the vessel, in whatever direction it is, enlarges under these circumstances, by the impulse of the blood. Hence we may account for profuse *hæmorrhages*, sometimes proceeding from small wounds, where we are sure there are no large arteries, especially if the wounded vessel lies near a bone : a remarkable instance of which I had from a very

eminent practitioner, of a pregnant woman who had a small splinter of wood thrust into her finger, which wounded an artery near the joint ; in consequence of which, such an effusion of blood ensued as threatened abortion and even her life, and was restrained with difficulty by the surgeon, when he was called to her.

If a small artery is totally divided, lying contiguous to, or perforating a bone, it may be incapable of retracting and contracting, as we have described, to stop the flux of blood, as sometimes happens after extracting a tooth. This consideration may teach us to proceed cautiously in scalping, upon the authority of the great professor *Monro* in his *Osteology*, where we know arteries penetrate the skull, as they may retract so far, upon division, as to create much trouble and difficulty in restraining the *hæmorrhage*.

When a styptic upon lint, or some kind of soft substance, is applied on account of an *hæmorrhage* proceeding from the extraction of a tooth, the alveolus should be well filled with it down to the bottom, and then some solid body of proper dimensions used, adapted
to

to the space, in order to make a strong pressure by shutting the jaw, which should have a band pass underneath it to be affixed on the top of the head, that the jaw may not be fatigued and lose its power. This is the best method of making compression on this occasion, as I have experienced. The actual cautery is sometimes necessary; and in some parts of the mouth it must be looked upon as the only expedient to stop an effusion of blood.*

F 3

Should

* In a dissolved crisis of the blood, violent hæmorrhages sometimes happen from the gums, mouth, and tongue, even without a wound. In the year 1753, I was called to a child of between seven and eight years of age, who had a violent hæmorrhage, in consequence of drawing a tooth himself, that had been long loose; besides which, I observed an oozing of blood from every part of his gums, mouth, and tongue. The use of the bark with alum, joining rhubarb to them occasionally; drinks acidulated with sp. vitriol, and the common astringent topical applications; strictly enjoining a proper regimen and incaffating diet, proved his cure, though he was apparently in the most imminent danger. It is remarkable that this child's grandfather had all his life been subject to bleeding at his gums, and sometimes profusely. A very worthy friend of the faculty consulted me a few years

Should not the artery be quite divided, there is a possibility of an aneurism ensuing, after the wound of the vessel is united, because the cicatrix is not so strong as the coats of the artery, to resist the impetus of the blood ; which our eminent countryman *Wise-man* tells us, happened to a butcher in *Westminster*, who was wounded between the thumb and fore-finger.

Upon the total division of a large artery in the extremities, the force by which the blood is sent from the heart, overpowers the contraction of its mouth, and compression from the circumjacent parts ; or if such a vessel is only punctured, a fatal *hæmorrhage* may ensue, unless prevented by art, or the patient's fainting should happily prove the means of
saving

years ago for his own son, in a similar case, though rather more threatening, as he had for a long time been subject to lived spots dispersed universally in great abundance, showing a higher degree of dissolution of his blood ; yet he was cured by the same treatment.—I remember seeing, many years ago, a man of an advanced age, who had such a constant oozing of blood from his gums and sides of his mouth, as proved too obstinate for the skill and utmost endeavours of a very able physician and surgeon.

saving his life; under which circumstance, the inadvertent or incautious use of cordials, with a view of reviving the patient, might prove his destruction.

When the brachial or femoral artery is wounded, though the patient should not perish by the *hæmorrhage*, the limb must soon die for want of nourishment. In this case, the progress to putrefaction will be very swift, attended with an emphysema of the cellular membrane, occasioned by an expansion of rarefied air from cell to cell: and the limb being deprived of the regular influx of the vital fluid, the nerves, giving sensation and motion, lose their energy and influence. A wound of this kind generally requires immediate amputation, and to be performed at the part wounded; but if the brachial artery is wounded near the axilla, or the axillary, it is necessary to take the limb off at the joint; yet, as there are instances of the brachial artery dividing into two, soon after it leaves the axilla, which *lusus naturæ* I have observed at different distances in the arm, it will be rational practice, when we feel a pulsation at the wrist, to treat a case so circumstanced as an

aneurysm, as we shall hereafter direct. I lately saw the same kind of *lufus naturæ* upon the thigh, in an amputation about the middle, on account of a *spina ventosa*. The branches of the artery ran parallel, at the distance of near an inch, and I could not discover any difference in their size. What practical use or inference is to be drawn from this remark, I leave to the reflection of surgeons, as it may not be altogether unworthy their attention.*

The great apprehension of danger from an *hæmorrhage*, in consequence of amputating the arm at the shoulder, has proved a discouragement to the practice; but I am convinced, that compression by an appropriate machine, having a well adapted compress, applied upon the little pectoral muscle just beneath the clavicle, where the artery passes into the axilla, and acted upon by a screw regulating the degree of pressure by feeling the pulse at the

* Vid. de Haen de aneurysmatibus, in parte septima Rat. Medendi.

He there relates a memorable cure of an aneurysm opened in the thigh, at the hospital in Vienna, where he was physician.

the wrist, will effectually answer the purpose. This I have demonstrated long ago to many of my brethren; and I am in no doubt of being able to stop the current of the blood in that manner, with the assistance of the thumb and fingers of my other hand upon it, long enough without being fatigued, for the operation to be performed; the operator leaving, as is directed, the muscles, between which the brachial artery runs, to be divided last, when it may be as easily taken up by the needle and ligature, as after any other amputation, without being subject to the inconveniences attending the methods proposed by *Heister* and others in this important point.—For want of some such compressive means, I saw a very dexterous operator meet with great trouble and difficulty, by chusing first of all to make incision between the muscles, in order to convey a ligature above the artery alone, which circumstance prolonged the operation a great while, and had he not been as intrepid as judicious, it might have disconcerted him very much: however, it succeeded happily. What made this operation necessary was an inveterate ulcer, accompanied

nied with a caries of the bones in the joint, which had reduced the patient exceedingly, and had brought her life into imminent danger.*

The following operation may here be just taken notice of, though it is highly probable it will rarely, if ever, be attempted.

The members of the Royal Academy at *Paris*, proposed to the consideration of surgeons, a few years ago, in their prize-question, the expediency or practicableness of amputating the thigh at the joint. Though it might appear too enterprising for a surgeon to attempt such an operation, yet, I think, the question demands regard ; for supposing that the femoral artery, just below *Poupart's* ligament,

* See Monsr. La Faye's method of performing this operation, in the second vol. of the Mem. of the Royal Academy of Surgery. He has distinguished himself very much by his notes upon Dionis's operations in surgery.—Monsr. Le Dran, a very eminent surgeon at Paris, says his father was the first who performed it. To this excellent practitioner and writer, my worthy friend Mr. Gataker, surgeon extraordinary to his majesty, &c. has done justice, in his translation of his operations in surgery: and in his own compositions we find great purity of style as well as judgment in his profession.

ligament, under which it passes out of the *abdomen*, should be wounded, or some incurable accident happen to the joint, if in a thin, healthy subject, would it not be worth our deliberate consideration and attention, joining in consultation the ablest and most experienced of our brethren, that could be convened upon such an exigence? *Celsus's* rule is : “ *Anceps remedium potius quam nullum.*” And it certainly becomes the character of a surgeon to be neither rash nor timorous. But in an incurable *caries* of the bones of the joint, there appears but little encouragement to expect success should attend this operation, for very obvious reasons.

Boerhaave mentions a very remarkable case of a peasant near *Leyden*, who had the axillary artery totally divided with a knife, upon which accident a great effusion of blood ensued, and the patient fainted. The mouth of the vessel retracted so far, that it was impracticable to come at it with a ligature, or stop the *hæmorrhage* by any other means ; and in this sad and hopeless condition, the poor man was abandoned to his fate. He

continued

continued several days in a languid state, apparently ready to expire every moment, in which nature performed what his surgeons could not, by closing up the mouth of the divided artery. The arm decayed, and gradually shrunk and dried, becoming at length a rigid piece of mummy, which he carried about a long while.

I was desired a few years ago, by a surgeon, to attend a patient with him, who had just before been thrown out of a cart by its overturning, when he was inebriated to such a degree that he had entirely lost his senses. The wheel of the cart passed over the top of his arm and shoulder, confusing those parts very much quite to his neck; and at this juncture an iron hook, belonging to the cart, entered between the *biceps* and *coracobrachialis*, making a large lacerated wound, including the *fasciculus* of nerves which take that course. The limb was wholly deprived of sensation and motion, and finding no pulsation at the wrist, we concluded the *brachial* artery was divided; but the *hæmorrhage*, which at first was very profuse, was stopped by the retraction of the vessel, and having
the

the arm confined to the side. Had not the drunken condition the patient was in, and the violent contusion of the parts surrounding the joint, discouraged us, we should have thought it right to have proposed immediate amputation of the arm at the joint ; but under such forbidding circumstances, it appeared too rash and dangerous an attempt. The accident happened in the evening, and till the morning following, there was a considerable degree of heat diffused throughout the limb, which next morning, in different parts, began to appear discoloured, emphysematous, and gangrenous ; by noon it was totally dead to the fingers end, and the patient expired that day about six in the evening. Next morning we examined the limb, found the artery quite divided, having the superior end retracted into the *axilla*, and separated more than an inch from the inferior ; and it then evidently appeared to us, that the hook had included and injured the bundle of nerves, as there was reason to believe at first. In this short space of time, the limb was become so putrid, that we could not bear to stand over it, to make the necessary examination, till

till the stench was corrected, by well washing it with warm vinegar and brandy.

Wounds of the arteries naturally lead us to say a word or two concerning *aneurysms*.

When one or two of the three coats of an artery are wounded, and the wound healed, the other, by the propulsion of the blood, may be gradually dilated and protruded, so as to form a bag. Under these conditions, the pulsation will be plainly felt in the tumour, till it is increased to a considerable magnitude, in which the blood may sometimes acquire by subaction, a laminated, leathery substance, as it frequently does in the true *aneurysm*, from the gluten of the blood. The tumour, in consequence of such a partial wound, is small in the beginning, and generally makes a slow progress; whilst it is of a small size, the blood remaining in a state of fluidity, may be forced into the artery, but it will return as soon as the pressure is removed, the tumour appearing again. In this state the skin commonly retains its natural colour, but afterwards, when the tumour is enlarged, it often has a dusky red or livid hue. The kind of wound now under consideration,

tion, produces a mixed species of *aneurysm*, compounded of the true, which is a dilatation of all the coats of an artery, and of the false, by having one or more of them wounded. It is a case that rarely occurs, but may happen in bleeding.

As a dilatation of the artery alone constitutes the true *aneurysm*, the tumour is generally more oblong than in the mixed kind, and both must necessarily be more circumscribed than the false, proceeding from a perforation of all the coats of that vessel; under which circumstance the blood, in a short time, is frequently diffused far about. In this case the small apertures of the teguments closing, the blood may readily escape out of the artery, insinuating itself into the cellular membrane and interstices of the muscles, sometimes raising a swelling in the parts quickly, turning the skin of a ruddy or livid colour. This tumour increases faster or slower, according to the resistance the blood meets with; it yields but little to pressure, scarce any pulsation is to be felt, when of any considerable duration or size, and, unless seasonably prevented, the limb will be brought

brought into imminent danger. This accident has often happened by bleeding in the lower vein of the arm, called the *basilic*, where the pulsation of the adjacent artery is conspicuous in some arms: and it has been observed by accurate anatomists, that when the brachial artery divides before it approaches the joint, the ulnar and radial branches of it run more superficially, than when the division is at, or just below the joint as usual.

As a spurious or false *aneurysm*, as this is termed, may proceed from an internal cause, as acrid matter eroding the coats of the artery; so may a true one arise from a contusion, or rather external injury, weakening them and making them liable to distention, by the impulse of the blood.*

When

* These authorities may be consulted among others, in respect to the various kinds of *aneurysms*.

*Wise*man's observations upon *aneurysms*.—*Macgill*'s history of an *aneurysm*, and professor *Monro*'s remarks upon that subject, concerning the formation of an *aneurysm*; Med. Ess. vol. 2.—Doctor *Hunter*'s observations upon the same subject, in the *London Med. Obs. and Inqs.* vol. I. II.—Mr. *Warner*'s observations on two femoral

When veins are wounded, the blood does not flow with that impetuosity and saltation, as when proceeding from an artery, but in an equal stream; nor is venal blood so florid as arterial, which is also a mark of distinction to be considered in these wounds.

When the *lymphatics* are wounded, they discharge a fluid resembling water, which sometimes becomes acrid, eroding the neighbouring parts. It often proves troublesome

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to

femoral *aneurysms*, in the third edition of his very useful Cases in Surgery.—*Mem. de l'Acad. roy. de Chirurgie*.—*De Haen de Aneurysmatibus Rat. Med.*—*Morgagni de Sedibus & Causis Morborum*.—*Marcus Aurelius Severinus, de efficaci Medicina*.—*Lancisus de Motu Cordis, & Aneurysmatibus*.—*Fernelius, Marchetti, & Ruysch*, speak of having observed enlargements of the ventricles of the heart; which was also found to be the case of his late Majesty, attended with a rupture of the right ventricle, whence proceeded his sudden death.—Doctor *Hunter* shows in his anatomical courses several *aneurysmal aortæ*, accompanied with caries of the ribs and *sternum*.—*Ruysch* has observed the like.—What Doctor *Friend* has written concerning *aneurysms* in his history of physic, where he treats of the surgery of *Paulus Ægineta*, claims an attentive reading.—Also see what Doctor *Donald Monro* says upon *aneurysms*, in the Essays physical and literary of the *Edinburgh Society*, vol. 3.

to stop the discharge from these fine pellucid tubes, which now and then happen to be divided in bleeding, without any fault in the operator, or possibility of avoiding them, as they cannot be discerned when they accompany the vein, lying in the way of the lancet. I have met with an accident of this nature three or four times.

Wounds of the glands are not generally attended with threatening symptoms; but they are rather more disposed, from the texture of the parts, to produce ill-conditioned fungous flesh, and the division of their lymphatics or excretory ducts, may make the cure prove tedious and troublesome, as I have observed, on account of a large watery discharge, that sometimes ensues; and, according to the respective uses of the fluids, which the glands secrete, the animal œconomy may suffer by their being wounded.

When a nerve is punctured, or divided only in part, a variety of alarming symptoms generally supervene, in proportion to the tenderness of it, and firmness of the parts it is attached to; and it is not unreasonable to suppose there may be something constitutional,

tional, in the production of the symptoms, to a greater or less degree, as there is a manifest difference of irritability and sensibility in different persons. When a nerve happens to be partially divided, the undivided fibres having its whole contractile force to sustain, it must consequently be more irritated, and attended with a greater degree of pain, which sensation sometimes is not so violent at first, as to demand particular notice, though at other times it is, and often extremely acute; throwing the whole nervous system immediately into disorder, requiring a total division of the nerve to appease the orgasm. In a total separation of a considerable nerve, though the symptoms will be less severe under that circumstance, yet more pain may be felt above, at some distance from the wound, than in the wound itself, from a divulsion of the fibrils of the resilient part of the nerve: and should a principal branch be divided, the inferior parts that were supplied from it, having lost their communication with the brain, will be deprived of sensation and motion; by which, nutrition will also be impaired; the nervous influence being found

necessary to that purpose. Though the wound itself may deceive the eye, and have the resemblance of a simple wound, the symptoms, sooner or later, will declare what part has suffered : and sometimes a corrosive ichor issues from the wound, ex-coriating the part it falls upon. Obstruc-tions in the capillary vessels, creeping along the membranes, which envelop the nerves, or that are ramified in the universal connect-ing substance, the *membrana cellulosa*, may soon occasion an inflammation in those parts. These concurring causes may be productive of direful effects ; as intense pain, fever, in-flammation, gangrene, delirium, and con-vulsions, soon bringing the limb into danger, and death may close the dismal scene, unless prevented by the utmost care and early atten-tion. *Hippocrates*, *Pare*, and other observa-tors, ancient and modern, relate many fatal consequences from wounds on the nerves.

When a tendon is punctured, almost the same formidable symptoms may follow, as in the puncture of a nerve, and they have often been the consequence of bleeding, from wound-ing the tendon of the biceps muscle, or perhaps
more

more frequently, the tendinous expansion of that muscle, which goes off from the tendon in a narrow compass, just below the bend of the arm, under the median vein, soon expanding over the muscles of the cubit, bracing them together to assist their action. Sometimes, upon this accident, the pain does not come on immediately to an intense degree, but gradually extends upwards, according to the course of the muscle, and of the tendinous expansion downwards, attended with tension and inflammation, depriving the arm of flexion, or of both flexion and extension.* When the tendon is partially divided, the wound is accompanied with more pain, than when totally separated; for the same reasons, as assigned in consequence of wounds of the nerves. Should the tendon be quite cut

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through,

* When the king of *France* had a tendon punctured in bleeding, *Paré* says he instantly complained of pain upon the entrance of the lancet, and his whole arm swelled immediately, and became very painful; yet it was happily cured in three weeks, by the common treatment, under the direction of that eminent and experienced surgeon.—In this case, semi flexure is the proper position to keep the limb in, the muscles being then in a state of relaxation.

through, by the contraction of the muscle, of which it is a part, the end nearest it, if it is a long muscle, will be far retracted under the adjacent parts, and the muscle lose its use till the wound is healed, when, by means of the intermediate substance, furnished by nature, by the assistance of art, as we shall show hereafter, the power of the muscle may be restored.

The symptoms attending wounds of the membranes, and ligaments, surrounding the joints, have great affinity to those accompanying wounds of the nerves and tendons. *Hippocrates* tells us of two persons, who died convulsed from such wounds of their feet. Many other melancholy instances might be mentioned, upon good authority; some I have seen. We may consult that truly great and experienced practitioner, serjeant *Wise-man*, upon this occasion.

Though the tendons, membranes, and ligaments have but little sensibility in a sound state, yet when wounded, and become inflamed, they grow most exquisitely sensible and painful, as daily experience evinces.—Baron *Haller's* treatise of irritability and sensibility,

sibility rather tends to mislead practitioners ;* but in order to obviate such inconveniences, as might arise from implicit faith, in what he therein advances, as he is one of the greatest physiologists of the age, the late professor *Whytt's* answer to that treatise should be read by all means.

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Baron *Haller* was professor of physic, &c. at *Gottingen*, and *Whytt* a very eminent professor at *Edinburgh*. The baron retired to *Bern*, in *Switzerland*, upon his Britannic majesty's *German* dominions becoming the seat of war, where he wrote a voluminous physiological work ; and was also engaged in the state as well as in his profession.

O F

P R O G N O S T I C S

I N

W O U N D S.

NOTHING more truly distinguishes a rational, regular, experienced practitioner from a quack, than his making a right prognostic, or prediction of the event of a disease. This kind of foresight makes him looked upon as a sort of prophet, and does him great honour; but then it is necessary for him to proceed very cautiously, lest he should err in his judgment, in a point of such consequence to his character. *Hippocrates* seemed to be truly sensible of this, when he expressed himself thus. “Whoever would
 “ ask pertinent questions, and answer judi-
 “ ciously those proposed, refuting objections as
 “ much as possible, must well consider the
 “ cause

“ cause of the disease, what reason there is
“ to believe it will have a good or bad event,
“ be of long or short duration ; and, in
“ wounds, whether they will prove mortal
“ or not ; which are of good, and which of
“ bad presage, which doubtful in their suc-
“ cess ; and whether the use of the limb
“ will be preserved or not, &c.” Or as
Celsus has it more concisely. “ Above all,
“ a surgeon ought to know what wounds are
“ curable, what are easy, and what difficult
“ to cure.”

From the venerable authorities of antiquity, we see it was expected that surgeons, in those days, should pronounce whether the patient would recover or not ; whether the cure would be easy or difficult ; if it would prove a short or tedious work ; if it would be a perfect or imperfect cure ; in what condition he might be afterwards, or what infirmity or disease might remain ; and less cannot be required in these modern and more enlightened times. However, as few people are endowed with fortitude of mind enough, to bear unfavourable predictions, without being too much affected, the prudent surgeon
will

will therefore act with great circumspection on this occasion, and rather acquaint the patient's relations or friends, with the danger he apprehends him in, as the most effectual means of guarding against censure ; giving the patient reasonable hopes at the same time, which may prove the best cordials to the afflicted.

In order to regulate our judgment in prognosis, we must consider what wounds are mortal, and what not, with the various species of them. Those deemed mortal, as we have observed in the general division, are either such as cannot be cured by art, or such, as left to themselves, would certainly destroy the patients, yet, by the assistance of a skilful hand, may be cured. It is a matter of great difficulty and nicety, to presage the patient's fate ; for we have surprising accounts transmitted to us, and well authenticated, of the recovery of persons, without the least prospect of a favourable event ; and our own observation and experience will confirm it. *Hippocrates* pronounces the doom of those, who are wounded in the brain, medulla spinalis, heart, liver, diaphragm, bladder, and lungs,

lungs, when more air comes out of the wound than enters the lungs by the trachea; he also ranks wounds of the large vessels of the lungs, and of the neck, and large transverse wounds of the stomach and intestines, among those of a mortal nature, but says, when small and longitudinal in the stomach and intestines, some may escape.* *Celsus* agrees with *Hippocrates*, adding some specifications, in respect to the wounded parts; but their sentiments concerning the mortality of wounds admit of farther consideration.—

Boerhaave's manner of determining this important point is more methodical than any other; he divides mortal wounds into five distinct classes; the first is when the influx of the *liquidum nervosum*, or other nervous influence, whatever it is, operating upon the heart, on which its motion depends, is obstructed, and which impediment may arise from four causes.†

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* In Coacis Prænotionibus.

† As we know, by observation, the effects of injuries done to the brain and nerves, it is to no purpose in surgery to embrace any hypothesis or doctrine concerning those parts. The greatest philosophers and physiologists

are

The wounds that more immediately produce this fatal effect, are those of the *cerebellum*, or *medulla oblongata*, between which there is a strict and mutual communication; and whence nerves are distributed to the heart, and other parts upon which vital action depends. I believe we have not an instance upon record, of a person recovering a wound in those parts; but wounds of the brain itself have been cured, even when a considerable quantity of it has been evacuated, upon the authority of the best observers, as we shall particularly mention hereafter.

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are divided in their opinions; some are advocates for animal spirits, or the nervous fluid; others for vibration, considering the nerves as elastic cords; and some admit of electrical fire, collected by the body, making the nerves the conductors of it, to carry on the wonderful communication and intelligence, which we observe between them and the brain, the body and the mind; but this abstruse subject seems now no better understood than it was in the great *Steno's* time, who, in his lecture upon the brain, makes a beautiful and ingenious confession of ignorance, in respect to the nature and operation of that curious organ, which perhaps will ever remain beyond the comprehension of man's understanding.—*Nemo scit quantum nescit.*

The second cause that may deprive the heart of the nervous influence and motion, is a pressure upon the brain itself, by a depression of the skull, or from some other cause. The lodgement of blood or other fluid may easily affect the brain by compression, as it uniformly fills its bony case ; or by stimulus or erosion, as they are apt to become putrid and acrid by heat and confinement, producing, sooner or later, fatal effects. *Hildanus, Tulpius, Bohnius, Schenkius*, and other observers, furnish us with a variety of cases to this purpose : and innumerable instances might be produced, of extravasations on the superior parts of the enveloping membranes of the brain, cured by trepanning, and evacuating the stagnant fluid.

The third cause that interrupts the nervous influence upon the heart, is a wound in the superior part of the *medulla spinalis* ; because the *medulla oblongata, cerebrum, and cerebellum*, have an intimate connexion. It is common in anatomical experiments, in order to kill the animal instantly, to thrust in a sharp instrument between the *vertebræ* near the head ; and *Sennertus* speaks of a butcher that
used

used to kill his beasts in that manner.* For the most part, injuries done to the inferior parts of the *spinal* marrow prove mortal, as we learn from *Tulpius*, *Bohnius*, and others; at least the lower extremities become paralytic, as I have seen.

The fourth cause of the cessation of the motion of the heart, for want of a nervous influence, proceeds from the *cardiac* nerves being wounded; but it is scarce possible, that these nerves should be wounded, without opening blood-vessels, the consequence of which alone would be death inevitably.†

The second class of absolutely deadly wounds consists of those, which penetrate either the *auricles*, or *ventricles*, of the heart, allowing a passage for the blood to flow out of it; for the continual motion of the heart hinders *reunion*; and even in superficial wounds, when the blood falls into the *pericardium*

* The Sardinian butchers show their humanity, in killing their beasts with unerring dexterity, by dividing the spinal marrow at one stab, between the first and second vertebræ of the neck, as I have been informed by a gentleman who had been in the island, and observed that was the practice at Turin.

† Vid. Lower de Corde.

cardium and cannot get out, the heart being compressed by that means, a stop will soon be put to its motion, and a period to life, which is confirmed by many writers, as *Forestus*, *Schenkius*, *Bohnius*, *Bartholine*, *Blegny*, *Diemberbroeck*, *Bonetus*, *Vidus Videus*, *Paré*, *Horstius*; and many observations to the same purpose are to be met with in the *Miscellanea curiosa*.*

In the third class of wounds of a mortal nature, are included those inflicted in parts that cannot possibly have applications made, to restrain the effusion of blood; as deep wounds in the lungs, &c. having large vessels opened, of which we have examples in *Timæus*, *Bohnius*, &c. There are instances of the recovery of patients of wounds in the lungs, recorded by *Stalpart Vander Wiel*, *Schenkius*, and others: and it has sometimes happened, that considerable pieces of the lungs

* Upon the authority of *Bartholine*, *Schenkius*, and others, we have instances of persons living, walking, and speaking, for a short time, after receiving a wound penetrating one or both ventricles of the heart. And it is well known, from experiments, that some animals will live and move a long while after taking out their hearts,

lungs have been cut off, yet the patients have recovered, as we may read in *Hildanus*, *Tulpius*, and *Ruyfch*, who tied a ligature about the protruded part before excision of it, in order to prevent hæmorrhage.*

Large wounds in the liver are a kin to those in the lungs, and the branches of the *vena cava*, or *portarum*, are followed with like fatal consequences, when wounded, as attend opening the *pulmonary* vessels, which may be observed in *Timæus*, *Schenkius*, *Bohnius*, &c. Smaller ones of this part have been cured, as we may learn from those authors; and we have a remarkable history of a wound in this bowel, related by *Hildanus*, in his epistle to *Sennertus*, which ended happily.

The spleen has the largest arteries, in proportion to its size, of any *viscus* in the body, except the heart, and through its middle
runs

* When the great general *Wolfe* fell, and left much to fame, at the taking of *Quebec*, it was currently reported that another brave officer, who accompanied him in that expedition, was shot through the *thorax*, and had the wound cured, after cutting off a piece of the lungs, protruded in a mortified state.

runs a *sinus venosus*; therefore, when they are opened, wounds of the spleen are to be deemed mortal; yet we have reason to believe, there is a possibility of preserving the patient's life, by a total excision of it, as was verified a few years ago, in the case of one of sir *Robert Rich's* dragoons, who was wounded at the battle of *Dettingen*, and left all night in the field weltering in his blood, with the spleen hanging out of his body, in a mortified state: next morning he was carried to the surgeon, who immediately extirpated it, after tying a ligature round the large vessels; and the patient recovered to be able to do duty in the regiment. Doctor *Monro*, physician to *St. George's* hospital, told me, he had the history of this remarkable case from the surgeon himself, who is a man of great veracity.—This operation has been frequently performed upon dogs, by way of experiment, and they have survived with but little apparent detriment to their healths, or their vital or animal functions, except growing rather fat and lazy afterwards.—*Forestus, Parmannus, Bobnius, Schenkius, &c.*

may be consulted concerning wounds of the spleen.*

Wounds of the kidneys may be arranged in the same class, because of the large emulgent arteries and veins ; and the urine, running out of the wound when it happens to penetrate the *pelvis* of the kidney, may prove an obstacle to its coalition : however, some wounds of the kidneys have been cured, as we see in *Fallopins*, *Forestus*, and other authentic writers ; and I have been a witness of the same. We have the extraordinary case of consul *Hobson*, at *Venice*, handed down to us, upon whom *nephrotomy* was successfully performed.

* Though *Democritus* and others have looked upon the spleen as an useless part, yet, considering the large blood-vessels belonging to it, &c. we may more reasonably conclude, with other physiologists, that it must be an organ of much consequence in the animal œconomy, though they are not agreed about its use.—See doctor *Stukeley*'s learned lecture, called the *Gulstonian* lecture, read in the theatre of the College of Physicians, upon this *viscus*, in the year 1722 ; at whose request it was printed.—To this excellent lecture is prefixed, the much admired pindaric ode upon the spleen, by the late countess of *Winchelsea*.

performed by the celebrated *Marchetti*, professor of medicine at *Padua*.*

Wounds of the *pancreas* are to be concluded mortal, if its *duct* or blood-vessels are injured, whence the *succus pancreaticus*, or blood, may be discharged into the cavity of the *abdomen*, and there putrefying, cause inevitable death ; besides, as the situation of the *pancreas* is under the stomach, it cannot easily be wounded, without the weapon's passing through this organ also.

Wounds of the *omentum* are of the mortal kind ; for *that* having considerable ramifications of vessels upon it, which may be divided by the thrust of a sword, or other weapon, the effused blood falling into the cavity of the *abdomen*, will kill the patient, unless it be evacuated by some means, or taken up by absorption.

Wounds of the *mesentery* generally prove mortal. This part is full of *glands* and *lymphatics*,

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tics,

* It is not improbable, that *Marchetti* might be directed in this operation by a tumour upon the *lumbar* region. The wound was not perfectly healed, but only a small fistulous opening remained, discharging a very little matter, having an urinous smell.

tics, and furnished with arteries and veins in abundance, running to and from the *intestines*, with collateral vessels dispersed in it ; upon cutting of which, such an effusion of blood will ensue, as may soon destroy the patient, by filling the cavity of the *abdomen*. *Bobnius* relates some remarkable cases of this sort. And wounds in this part may prove mortal, independent of any other cause than the *mesenteric* nerves being injured, which have a great influence upon respiration, and the vital functions.

Wounds of the stomach and intestines come under the same denomination, they being plentifully supplied with considerable blood-vessels, especially the stomach ; but there are many instances upon record, of wounds in these parts having been cured : those in the large intestines are not so dangerous, as wounds in the stomach and small intestines. The *peristaltic* motion of these parts is a great impediment to healing of these wounds ; and the nerves suffering may also be attended with very bad consequences. More will be said to this purpose, under that class

class of wounds, which deprive the body of nutrition.

The *uterus*, in a virgin state, is small, and never after gestation returns to its original size ; but when impregnated and distended, the blood-vessels enlarge in proportion, and wounds in it become more and more dangerous on account of the *hæmorrhage* ; for the vessels in an unimpregnated state of the *uterus*, that will scarce admit of a bristle, will be dilated to the size of a swan's quill, or more, before delivery ; and should the *uterus* then be wounded, a fatal effusion of blood would probably ensue, occasioned by distention of the part with the *fœtus*, preventing its contraction, necessary to close the mouths of the vessels ; but if the exclusion of the *fœtus* happens soon after the wound is inflicted, there is reason to hope the contraction of the *uterus* should constrict the patent vessels, and prevent a mortal *hæmorrhage*, from what has been observed in the success of the *cæsar*ian operation.

Wounds of the bladder have been pronounced mortal, and incapable of healing, by *Hippocrates* and other ancient writers, sup-

posing it to be an exanguious part ; but daily experience proves the contrary, in cutting for the stone. There is danger of a profuse or mortal *hæmorrhage* in accidental wounds, upon dividing some considerable branches of the *iliac* arteries running along the neck of the bladder, which sometimes cannot be easily come at with a ligature, nor the *hæmorrhage* stopped by any other means. We may read what *Bohnius*, *Fallopious*, *Tulpius*, *Schenkiius*, &c. say upon wounds of this part.*

Wounds of the *aorta* are equally as mortal, as those that penetrate the ventricles of the heart ; and we cannot hesitate to pronounce the same fate will attend those who have the *subclavian*, *vertebral*, or *carotid* arteries opened, where we cannot have access to them. When the *carotid* is opened in the middle of the neck, by a large longitudinal wound, or if small, when properly enlarged, there may be a possibility of conveying ligatures above
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* I once knew a fatal *hæmorrhage* in consequence of lithotomy, that happened a few hours after the operation, which was well performed, and without any difficulty or effusion of blood in it worth notice, that could not be stopped by the utmost care of two able surgeons.

and below the aperture, which may prove the means of saving the patient's life; or should it be opened too near the head to put this method in practice, it may be worth while to try what pressure, upon some soft fungous substance, or upon an *escharotic*, will do; having a succession of understanding assistants, if they can be procured upon such an emergency, to relieve each other, and maintain a due and regular compression with their fingers, as long as should be found necessary, though it should be some days and nights; and, to make the force the more equable, some solid body, well adapted, should be placed next the compress. It is better for the surgeon's own sake to try these doubtful means, rather than suffer the patient to perish without any attempt to save him, even though they should prove fruitless. Any other large branches of the *aorta*, that cannot be come at, as the *mesenterics*, *epigastrics*, *hypogastrics*, &c. when wounded, will prove fatal; and nothing less is to be feared from wounds of the large veins, as the *venæ cavæ*, *vena port.* *subclavians*, &c. for they will soon

pour out more blood than the patient can bear, without loss of life.*

In the fourth class of wounds which necessarily prove mortal, are those that entirely stop respiration; which may happen several ways, as by a division of the *larynx*; by large wounds of the *trachea* or *bronchia*; by wounds penetrating both cavities of the *thorax*; and wounds of the *diaphragm* generally are attended with no happier event. If the *trachea* is quite divided near the *clavicles*, and the lower part of it retracted beneath them, by the natural power of the part and the weight of the lungs, there is no possibility of bringing the ends of the divided part together,

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* In dissecting out a large encysted tumour, deeply situated in a dog's neck, that was a very ungovernable patient, I wounded the *carotid* artery, which bled with great impetuosity; but I effectually restrained the *hæmorrhage* by passing a ligature as directed, and cured my patient; who ever after retained an angry remembrance of the operation, and would not be reconciled to me.

It is a memorable and melancholy history that *Boerhaave* relates of a young man, who had a sword thrust through his neck between the fourth and fifth *vertebra*, by which the *vertebral* arteries were divided, and lived nine or ten days either in a *syncope* or *hæmorrhage*.

consequently such a wound must prove mortal ; but when it is divided near the middle of the throat, it is not absolutely incurable.—Professor *Monro* instances the case of a lunatic, who cut his own throat in such a manner, that no air passed by the mouth, yet the parts were brought together and stitched, and the wound healed. *Tulpius* relates a similar case. *Bartholine* and *Paré* have some such. *Van Swieten* and *Heister* mention cases, where part of the *trachea* was carried away with a ball, the patients recovering by proper treatment.—These happy events should encourage *bronchotomy*, upon urgent occasions, when the patient is in immediate danger of suffocation, as it is an operation neither difficult to perform nor dangerous.*

Large wounds of the *bronchia*, which are the divisions or branches of the *trachea*, or *aspera arteria*, will produce fatal effects, and it is scarce possible, that they should be wounded, and blood-vessels in the lungs escape. We may recollect what was said before from *Hippocrates*, who includes those of
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* See des playes du larynx & de la trachée, &c. en Mem. de l'Acad. Roy. de Chirurg. tom. 1.

the lungs among mortal wounds, when more air passes out through the aperture, than enters them through the *glottis*, or *rimula* of the *larynx*. If there is a large opening on each side, into the cavity of the *thorax*, the air rushing in at once, will balance that within the lungs; consequently they will be left to their own contractile force, and collapse and compress their blood-vessels, obstruct the circulation, and cause suffocation and death. It was to this collapse of the lungs, upon passing the air into both sides of the *thorax*, though none of the *viscera* or blood-vessels suffered, that the physicians in the *Act. medic. Berolin.* attributed the death of a man, who was wounded by a broad sword through the *mediastinum*.*

As the *diaphragm* is one of the principal agents in respiration, wounds in it must be attended

* *Vesalius* used to demonstrate this fact in his anatomical lectures, by first opening one side of the *thorax* of a pig, by which that lobe of the lungs left off playing, then doing the same on the other side, the animal would soon have expired; but by sucking out the air, and shutting up the apertures, death might be prevented.—Read the experiments of doctor *Houssain* and others in Comment. *Van Swiet.* in Aphorism. *Boerhaavii* § 170.

attended with imminent danger, though not always mortal. Small wounds in the fleshy parts of this compound muscle have been cured, as we may observe in *Diemerbroeck*, *Schenkius*, and others; but wounds in the tendinous parts of it are deemed incurable. The abdominal *viscera*, which are constantly exposed to a considerable pressure, may be forced through wounds of this part into the *thorax*, as *Paré*, *Sennertus*, and others testify. The division of the *phrenic* nerve may destroy the action of the *diaphragm*, and also immediately affect the motion of the heart, which receives branches from it.

The fifth and last class of wounds, that art cannot cure, are such as deprive the body of nutrition, by preventing the passage of the food into the stomach, the preparation of chyle, and the conveyance of it into the blood; which we shall consider in order, according to the course of the aliment.

1. When the *æsofagus*, or canal by which the food passes into the stomach, is totally divided, its ends recede from each other, and cannot be kept together; consequently death must inevitably ensue: and the effect will be
the

the same, when a large wound, particularly a transverse one, happens in it, after its entrance into the *thorax*; but when not totally divided, before it enters that cavity, it has been cured. We have many histories of such cures having been performed from *Peyerus*, *Bohnius*, *Schenkius*, &c. and some such instances might be produced of our own knowledge. Professor *Monro* gives a narrative of a person, who cut his own throat, so that the aliment passed out at the wound, before it was stitched and dressed, and he was in great danger of being suffocated, by its falling into a corresponding wound in the *trachea*, notwithstanding the utmost endeavours to prevent it; yet he recovered, by the observance of an exact regimen, diet, &c. as we shall direct hereafter, in the method of cure.—*Benedictus Bonacurtius* says he cured a person, who cut his own throat in prison, making a large wound both in the *trachea* and *œsophagus*.*

2. Wounds

* See Dissertation par *Monf. Verdier* en *Mem. de l'Acad. Roy. de Chirurg.* tom. 3, in which are contained the opinions of many great men, besides his own, upon this subject;

2. Wounds of the stomach are of a mortal nature, by allowing the aliment to fall into the *abdomen*, by destroying its function and depriving the body of nourishment; but the more immediate danger lies in dividing the blood-vessels and nerves, which are distributed upon it in great plenty; and sometimes a wound in this organ causes sudden death, as we learn from *Hippocrates*, *Forestus*, *Timæus*, and others.—*Crollius* tells a story of a *Bohemian* peasant, who used wantonly to conceal a knife in his throat, so as no body could see it: however, at last this trick had like to have proved fatal to him; the knife slipped into his stomach, and after some weeks, being felt outwardly, an incision was made, through which it was extracted, and the wound healed.—*Jessenus* has recorded a memorable history of a man at *Prague*, who swallowed a knife, which made its own way through the stomach and *abdomen* some weeks after, and says, that he recovered. He also says,

subject; as *Galen*, *Paré*, *Tulpius*, *Vesalius*, *Bartholinus*, *Stalpart Vander Wiel*, *Palfin*, *Saviard*, *Dionis*, and his excellent commentator *La Faye*, *De la Motte*, *Garengcot*, *Ferrein*, &c.

says, he saw a man, belonging to the court at *Paris*, who voided a knife at the groin, nine months after it was swallowed.—*Laurentius Joubertus* relates a case of this nature, where a knife remained two years in the patient's body.—*Dicmerbroeck* gives a more surprising history of such a case ; and the knife, which is ten inches long, was extracted after cutting upon it, and is kept among the rarities in the anatomy chamber at *Leyden*, with the testimonial of the magistrates, &c. of the city of *Koningburgh*, to that university, verifying the fact, and the patient's recovery.* As there are, besides these, more instances, well attested, of large wounds in the stomach having been cured, as we shall mention hereafter, in the method of treating wounds in
this

* This operation was performed in the presence of a great many physicians, surgeons, and others, by doctor *Daniel Schwaben*, a famous physician, surgeon, and anatomist : and for performing successfully such a wonderful operation, he was appointed surgeon in ordinary to the king of *Poland*, and had signal honour conferred upon him and his family, by royal mandate. The history of this case was published at large by doctor *Daniel Becher*, professor of physic in the university of *Koningburgh*, and chief physician to *Uladiслаus* then king of *Poland*.

this part, they are not to be deemed absolutely mortal.

3. A total division of the small intestines, is to be looked upon as a mortal wound, by suffering their contents to be discharged into the cavity of the *abdomen*; by which, death must necessarily ensue, unless the ends can be brought into contact and stitched together, or the superior end can be made to grow to the margin of the wound of the teguments, by stitching, or any other expedient; for by this means an opening may be preserved for the exit of the intestinal contents, promoted by the peristaltic motion; but even in that case, should the division of the intestine be near the stomach, chyle would be wanting for nutrition of the body, and the wound in consequence end fatally. In wounds, whether tranverse or longitudinal, in these parts, when not totally divided, if they can be conveniently come at, stitching is advisable, as we shall direct in the treatment of them, in wounds of the *abdomen* and its contents.

4. Wounds of the large intestines, where the canal is, or is not, totally divided, are
not

not so dangerous as those in the small intestines, for very evident reasons; but we have instances in writers, and from our own observation, of the happy event of wounds in both parts.——The case recorded in the Philosophical Transactions, by Mr. *Needham*, an eminent physician at *North-Walsbam*, in *Norfolk*, is very pertinent and singular.

5. Wounds of the *receptaculum chyli*, and *ductus thoracicus*, must be considered as mortal, except under the circumstance, that will be specified hereafter, in the treatment of them, by depriving the body of nutrition;* consequently life cannot long subsist: besides, these parts essentially necessary to life are so situated, that it is hardly possible they should be wounded, without some other principal parts suffering also.†

OF

* *Vid. Walæum, Lowerum & professorem celeberrimum Deleboe Sylvium, de Motu Chyli.*

† See the great professor *Munro's* description of the *receptaculum chyli* & *ductus thoracicus* at the end of the 5th edition of his *Osteology*, &c.

OF SUCH WOUNDS AS WHEN LEFT TO THEMSELVES MAY PROVE MORTAL, THOUGH NOT SO IN THEIR OWN NATURE.

NOW we are to consider the second sort of mortal wounds, or those, which, left to themselves, without assistance from art, would inevitably kill the patient, but with it, may be cured.

1. Wounds of the head, attended with an extravasation of blood, or lymph, upon the *encephalon*, or a depression of the skull, &c. oppressing the brain, are of this nature; and, were no means used, would probably kill the patient; yet, by the application of the trepan, the impending danger may be averted; as we shall show, when we come to treat of wounds of this part.

2. Wounds of large arteries and veins, which the surgeon can come at, are of this class.

3. Wounds of the *viscera*, to which hand and medicine can be applied, are to be brought under this head; as for example, suppose a

wound inflicted with a cutting instrument upon the *abdomen*, and a wounded intestine presents itself, by sewing it together it may be cured, but without such treatment, the *fæces* will slip into the cavity, and the patient necessarily perish.

4. When extravasated fluids are contained in any of the three cavities, they would infallibly occasion death, without evacuation of them ; as by the trepan, when in the head ; by the operation directed in the *empyema*, when in the *thorax* ; and by *paracentesis*, when contained in the *abdomen* : for such fluids, particularly when in the *thorax* or *abdomen*, by the warmth and agitation of the parts, soon become putrid and acrid, producing dreadful symptoms, as we frequently observe. Whenever absorption happens, it must be before they have lost their natural fluidity.

Wounds, curable in their own nature, may have fatal events, from a variety of causes ; as through a neglect in extracting extraneous bodies, or discharging stagnant fluids, putrid or tending to putrefaction, especially when lodged in, or near, vital parts.

parts. A hectic fever and marasmus may be produced by the absorption of putrid matter ; and we have many instances of patients who died tabid from that cause. *Varicola*, *Tulpius*, *Forestus*, *Bohnius*, and others, mention such unhappy cases.

2. Errors and irregularities in the non-naturals, as air, meat and drink, sleep and watching, motion and rest, retention and excretion, and passions of the mind, often prove destructive in their consequences ; of which there are innumerable historical facts, admonishing us to pay the utmost regard to them, in the cure of wounds ; as we shall show under those heads.

3. The patient may suffer irretrievably by error of judgment, or practice, or through the surgeon's negligence. Mistakes, not to be remedied, may be committed by the ablest practitioners, through inadvertence or inattention ; and we have a very memorable example to this purpose, where *Hippocrates* took a *fissure* of the skull for a *suture* ; in consequence of which mistake, trepanning was omitted, till it was too late to save the patient's life ; but that great and good man in-

genuously confessed his error.*——A mortification, and other ill effects, may arise from too strait a bandage; of which I was once a witness, in a simple fracture of the leg, where a dreadful mortification was occasioned by it, and the patient's life and limb were saved with great difficulty. A case, more remarkable than this, fell under my care a few years ago, showing unskilfulness in another respect. A gentleman's son, about twelve years of age, discharging a small brass gun overloaded, the breech-pin, about 3-4ths of an inch long, flew out, and penetrated the upper eye-lid, passing between the globe of the eye and the orbit, down to the bottom. He was immediately carried to a pretender to surgery, who inadvertently stitched the wound, with this extraneous body in it, treating it, in other respects, very improperly;

* *Bontius* speaks of a soldier, in whose case a surgeon took an unusual continuation of the *sagittal suture*, through the middle of the *os frontis*, for a *fissure*; and and though the patient was at length cured, under his inspection and superintendence, yet the steps that had been taken, in consequence of the mistake, occasioned a separation of that bone at the *coronal suture*, and its coming away in two parts.

perly ; in consequence of which, pain, inflammation, &c. ensued, and occasioned my being called next day. After cutting the stitches, I discovered, by the probe, this foreign body, and when I had carefully enlarged the wound, extracted it, and by easy and gentle treatment, as our art directs, the wound was speedily healed ; but it was a considerable time before he regained useful sight. The whole eye sustained a violent shock, the pupil remained much dilated a long while, and though its figure is still oblong, yet he can see to read.*—*Paré* tells us he was sent for to a soldier, that had a large penetrating wound of the *thorax* stitched, and that upon cutting the stitches, a great quantity of putrid blood flowed out, after removing some that was concreted at the mouth of the wound, by which means he saved the patient.—*Hildanus* mentions two cases, where the patients suffered by corrosive applications. And the case of *Thrinon*, the son of *Damon*, related by *Hippocrates*, in his *Epidemics*, who was seized with an *opisthotonos*,

I 3

and

* I have lately seen this young gentleman, and find the pupil has recovered its circularity.

and soon died, in consequence of such an application to a nervous part, is a very striking and pertinent example to this purpose.—

Boerhaave gives a narration of a young gentleman's case, who received a wound in the radial artery, wherein the surgeon used a caustic application to restrain the *hæmorrhage*; and which made such ravage in the adjacent parts, that the median artery was eroded; whence proceeded such an effusion of blood, as killed the patient. He also instances the case of a person, who had the artery that runs between the *tibia* and *fibula* divided, in which attempts were made to stop the bleeding, by compression and bandage, without effect, and the patient bled to death. In both these cases, had the tourniquet been used, the wounds dilated, and the arteries tied, the patients might have been saved; or perhaps, after a sufficient dilation of the wounds, to come at the mouths of the bleeding vessels, proper styptics, with strong compression, without circular bandage which would obstruct the reflux blood, might have had the desired effect.—A surgeon of my acquaintance, deservedly in high reputation,

tion, told me he had been concerned for a man, who had one of the arteries that run between the *tibia* and *fibula* opened about the middle of the leg, with the point of a scythe ; and that the limb was amputated, he not being able to restrain the great effusion of blood. In this case, as every other attempt had failed, would it not have been practicable and advisable, after application of the tourniquet, to have dissected the muscles from the *fibula*, then to have passed under it some well adapted thin instrument to raise it up by, and keep it steady, sawing a portion of it off with a fine, proper saw, in order to have come at the bleeding vessel ? It appears to me this might have been done, without any very great difficulty, and with a strong probability of success.

4. Wounds may prove mortal in a bad constitution, that would be easily cured in a good habit of body, or state of health. They may be attended with fatal consequences, in hydropic, cacochymic, scorbutic, venereal, or consumptive cases, where the *vis vitæ* is weak, and the fluids thin and acrid.

THE METHOD OF MAKING A PROGNOSIS IN
WOUNDS.

AFTER having deliberately considered these specifications in the *diagnosis*, we shall be little at a loss in the *prognosis*. 1. We are to attend to the figure of the wound. A strait wound is better than that which is curved or angular, because the lips of it are more easily brought together, and kept in contact or proximity : and we need not say, that a superficial one requires less time to cure than that which is deep, or with loss of substance ; when deep, and so situated that the matter has not a free depending exit, the cure proves difficult and troublesome, for obvious reasons, requiring a counter opening. 2. We must consider the nature of the part wounded ; and the nearer the wound is to vital parts, so much the more dangerous. When arteries, tendons, or nerves, are hurt, the *prognosis* is plain, from the anatomical knowledge of the wounded parts. Wounds of the joints are difficult to cure, and generally

rally attended with worse accidents than in other parts of the limbs, on account of their being furrounded with tendons and membranes. If a wound happens in any part, that is in constant motion, as the *thorax* and *abdomen*, in respiration, *that* may prove, in some degree, an obstacle to its cure. 3. We must have regard to other accidents and symptoms that may attend wounds ; as *hæmorrhages*, extraneous bodies lodged in them, coagula of blood, poison, splinters of bones, contusion, pain, inflammation, fever, syncope, convulsions, palsies, apoplexies, &c. and according to these contingences, of which we shall particularly treat, the danger is to be estimated and determined.

We are next to bring under consideration, the patient's age and constitution, general state of health, what disease he is affected with, or whether he is addicted to excess of any kind or not ; for a healthy, temperate young person, whose blood is in a soft balsamic state, is much easier cured than the old and infirm ; or one whose constitution is injured by intemperance, or that is afflicted with some disorder, which, independent of
any

any other cause, might have brought him to his grave, as we have before hinted : and wounds so circumstanced, may frustrate the most judicious and rational methods of cure. Besides, we are to have respect to the season of the year ; for summer's scorching heats, and more especially sultry weather, with an humid air, are apt to bring on an inflammation, fever, large suppurations, a greater degree of putrescence and acrimony in the matter, and other bad consequences, proceeding from corruption and depravity of the blood and humours.

Having well weighed all these circumstances, nothing remains as to the *prognosis*, but to speak to the event, or what inconvenience the patient will suffer, after the wound is healed ; which, may be deduced from the premises. The consequences of dividing a principal artery in a limb will be a mortification ; the division of a principal nerve will cause an insensibility, immobility, and atrophy of the limb ; the separation of a tendon will be attended with the loss of motion, which depends upon the action of the muscle, to which it belongs ; a wound in the

medulla

medulla spinalis will occasion a palsy, or mortification, of the inferior parts ; an immoderate suppuration, in a very large, deep wound, by absorption of the putrid matter, may end in a hectic fever and *marasmus* ; a great loss of blood endangers a dropfy ; for the solids, by that means, become so weak and inelastic, that they cannot duly elaborate the new *ingesta*, or well perform, what the ancients called the second concoction, which is chylickation, consequently the chyle must be left crude, and ill prepared for sanguification, and the various purposes of the animal œconomy.—If a wound penetrates the *thorax* and lungs, a *phthisis pulmonalis* may ensue ; and happening in any other considerable organ, an ulcer may remain, proving the fomes of a hectic and consumptive disorder.—It is unnecessary to mention more particulars to this purpose ; for after reflecting upon what has been said, and being well acquainted with the structure of the human frame, and the laws of the animal œconomy, any person may be a competent judge in these matters ; but no one can without those qualifications.—*Anatomy, physiology, ætiology, and pathology,*

pathology, being so evidently requisite to enable the surgeon to make prognostics to his credit, as well as to cure his patient, as has been already intimated, no farther exhortation to the attainment of them is necessary.

OF THE INTENTIONS IN THE CURE OF WOUNDS,

THE three following intentions are to be answered in curing wounds; and when any extraneous bodies are lodged in them, they must first be removed, as will be particularly directed, in the accidents attending wounds.

The first intention belongs to incised wounds, and is performed by bringing their lips, as much as possible, into contact or proximity, keeping them so till they be united; which is called healing by *symplysis*, or the first intention.

The second intention is accomplished, by promoting digestion, and regeneration of the loss of substance; which is termed curing by *syssarcosis*, or by the second intention.

The

The third intention is covering the wound, whether incised or otherwise, with skin, which is called *cicatrization*.

OF SYMPHYSIS.

AUTHORS generally begin to teach the cure of wounds by *symphysis*; but, considering there is always some supply of new matter, the second intention, called *syssarcosis*, is necessary to be understood, before we can be well acquainted with the first, and have true and clear ideas of it. *Symphysis*, according to its definition or etymology, is that branch of surgery, as we have said, which teaches us to bring parts separated into contact or approximation, and unite them; for which purpose we must endeavour, as much as possible, to obtain an exact coaptation of them, after cleansing the wound from blood, &c. with a sponge and warm wine and water, or some such liquor, and then keep them in juxtaposition, till the fibrils, &c. shooting out from each side of the wound, and interwoven as described in the appearances of a simple wound,

wound, become firm and of one substance ; which we may observe is a kind of *syssarcosis*, or incarnation. It is to be remembered, that this intention is practicable only in recent incised wounds ; and when we have made a good and regular coaptation of their lips, we must endeavour to keep them as much in contact as we can, by bandage or future, or both together ; and we shall show their subservience, when we describe them, and their uses. This kind of wound, that the union of the parts may not be interrupted, is to be seldom dressed ; and its dressing should consist of agglutinants, or such kind of applications, as is least apt to produce *pus*, avoiding all unctuous things. Though stitching of wounds with the needle is not so much practised as it was formerly, and what is called the dry future, more frequently used, yet the needle and thread will be found absolutely necessary in some cases, as we shall demonstrate.

Syssarcosis, or the second intention in the cure of wounds, is the wonderful operation of nature, manifested in the elongation and distention of the *vasa minima*, with the ap-
position

position of proper materials from the blood, for the formation of new vessels, as has been described: and both solids and fluids must be in a good condition, or the *vascular compages* at the bottom of the wound, &c. called the incarnation, will prove either too compact, or loose and luxuriant; therefore, though *syssarcosis* is, properly speaking, the work of nature, we see it is the surgeon's business, to assist her in it, that she may not be obstructed; and this assistance must be given, by endeavouring to preserve the vessels in a proper tone or elasticity, to prepare and circulate the fluids for the generation of the lost substance; which is to be effected by suitable dressings, to prevent putrefaction in the wound itself; at the same time observing other rules, essentially necessary to be regarded, in dangerous wounds; as we shall shew in their respective places.

After directing the management of the wound itself, we shall describe the most convenient and useful bandages and sutures; then treat of the accidents or symptoms appertaining to wounds; and among them, introduce the manner of extracting extraneous bodies,

bodies, concluding this first part with the non-naturals ; all which appear of much consequence to be well attended to.

In order to cure large wounds, either with or without loss of substance, we should dress as expeditiously as we can ; as the access of the air is apt to contract the vessels in their tender state, and coagulate the fluids, obstructing nature's operation. Hence it follows, that we should remove the dressings no oftener, than is necessary to prevent the matter from becoming acrimonious, or its being absorbed into the mass of blood, where there is a large quantity of it made in deep wounds. This doctrine *Cæsar Magatus* and *Belloste* have taken great pains to establish ; who, like most authors, fond of their own opinions, have carried the matter rather too far. *Celsus* advises opening the wound every third day ; *Fabricius ab Aquapendente* every third or fourth day ; but there are no rules precisely to determine this point, which must be regulated by the judgment and experience of the surgeon, from circumstances and appearances. The general rule may be to dress, when the patient is

sensible

ſenſible of a diſagreeable itching about the part ; but the ſtandard for dreſſing is once in twenty-four hours, which is agreeable to the practice of the hoſpitals. This rule will certainly hold good, in moſt caſes, and it is ſupported by the authority of the beſt and moſt experienced practitioners of theſe days. It is true indeed, what *Fabricius ab Aquapendente*, who was one of the ableſt ſurgeons of his time, juſtly obſerves, that the patient may think himſelf neglected, when ſeldom dreſt, obliging the ſurgeon to dreſs him more frequently, though perhaps to his own prejudice ; but this point muſt be left to the ſurgeon's diſcretion.*

VOL. I.

K

The

* See two diſſertations, one by *Monſ. le Cat*, the other by an anonymous author, *en Rec. des Pieces pour le Prix de l'Acad. Roy. de Chirurg.* tom. 1. *Sur les Panſemens rares ou frequens*.—I believe none of the prize pieces of the Royal Academy of Surgery at *Paris* are yet tranſlated, which are excellent diſſertations upon various ſubjects ; therefore it is to be wiſhed they were, for the ſake of thoſe who do not read *French* ; or rather, it is to be wiſhed, that all ſtudents in ſurgery would make themſelves acquainted with the *French* tongue ; for very often it is a long while before a good book in that language upon this ſubject is tranſlated : and then the tranſlators,

The only applications, generally necessary at first, are fine, even, dry lint, with a pledget of soft tow or linen cloth, spread with the common digestive, or *ceratum album*, or *unguentum simplex*; which dressing should not be removed, till it can be very easily taken off; but the compress and bandage proper to be applied, may be changed, should the gleet prove large and offensive. Upon the removal of the first dressing, digestives are to be used, as *unguent. basilic. flav. unguent. e gum. elemi*, with the addition of *balsam e copaib.* or some other natural balsam, or fine, pure turpentine, occasionally, which are the best of digestives. A variety of compositions for this purpose, are to be met with in practical writers; the nature and consistence of which must be altered, according to circumstances, and the nature and disposition of the wound. These applications are to be made cold or warm, as the season of the year and appearance

lators, sometimes not understanding the science, though they do the language, their translations prove faulty and defective, as may be observed in the translation of Mons. Petit's excellent work *des Maladies des Os*, and others.

pearance of the wound shall direct, upon soft even pledgets of lint, which should be so applied, that the extremities of the vessels may be gently compressed; the wound must by no means be filled with hard dossils, or have a tent forced into it; for by such treatment the vessels would be so much compressed, as to hinder their stretching out, obstructing nature in the work of regeneration: also dressing the wound in such an irrational manner, with tents and hard dossils, prevents a free discharge of the matter, irritates the sensible parts, and bruises the tender, new-made vessels; whence often proceed obstructions, inflammation, pain, fever, &c. We need only consult *Cæsar Magatus*, *Wiseman*, and *Belloste*, to be convinced of these facts, if our own experience and observation have not sufficiently confirmed us in that belief, and shown the absurdity of a practice, now almost universally exploded; and which can never be beneficial, but upon very particular occasions, which must be left to the surgeon's discretion.*

K 2

It

* See two dissertations, one by Monf. *Le Cat*, the other by an anonymous writer, in answer to the prize question,

It is proper, after application of the pledgets, to cover the part with a plaster of *cerat. alb. unguent. tripharm.* or common plaster, which may be of use in keeping out the air, and in promoting the concoction of the matter, by preserving native heat in the wound; then easy compress and bandage complete the dressings, which require to be adapted and applied so as not to excite pain, or obstruct, in any degree, the circulation of the blood; for strait bandage would be as productive of evils, as tents and hard dossils. After dressing, we are to consider how to place the part or member, in the most easy and convenient situation or posture; remembering that pain not only obstructs the cure, but is in itself a dreadful evil, and to be avoided by all possible means that can be thought of.

When we are about to renew the dressing, we should take care to have all the *apparatus* ready, in neat and good order, before we remove the old; that we may not be obliged
to

question, proposed by the Royal Academy of Surgery, at *Paris*, for the year 1733. *Quels sont, selon les differens cas, les avantages & les inconveniens de l'usage des tentes & autres dilatans?*

to expose the wound to the air, whilst any thing necessary be preparing, that has through inadvertence been omitted. We are then to take off the dressings, as gently as possible, concealing, as much as we can, every disagreeable object from the patient's sight; the matter is to be wiped off with soft cloth, tow, or lint; for rough treatment not only causes pain, but breaks off the tender fibrils, or sprouting extremities of the vessels, hindering the incarnation of the wound. The best thing for this purpose is a piece of the finest sponge, expressed out of warm water, with a little wine or brandy added to it, which, by moderate pressure upon a superficial wound or ulcer, absorbs the matter at once in the easiest manner. We should perform the dressing, in all respects, as expeditiously and neatly as possible, leaving the part in the position directed: and when there are several wounds, we should never uncover them all at once, but always dress one, before we expose another. An attention to these circumstances will have a farther good effect; it will prove the means of ingratiating

the surgeon into the patient's favour, whose care and tenderness will not pass unregarded : and, by gaining his confidence and good opinion of us, his mind will be kept in more ease and tranquillity ; which is a matter of no small consideration, as we have observed in the introduction.

The bloody *serum*, called *sanies* or gleet, which wounds discharge at first, is sometimes immoderate, fetid, and of a blackish colour, and so acrimonious, as to erode the skin ; the confused fibres often look like a slough, the swelled and obstructed vessels giving the appearance of filling up the wound with flesh ; but it may be distinguished from good flesh, this being firm and florid, the other soft and pale ; and must be suppressed or removed, by some means, to lay the foundation for healing. The parts should be defended against excoriation, with plasters of some proper cerate, and the putrid, fetid scent, corrected, by sprinkling lavender-water and vinegar, or some such fragrant antiputrescent liquor upon the bandage, &c. All these circumstances demand

mand particular notice and consideration, especially with nice and delicate patients.*

Having considered the management of a wound, to which we had easy access, for the application of medicines, and from whence the matter was freely discharged, it is proper to give some directions concerning the treatment of a deep wound, with a small external orifice, where there is danger of a collection of matter, that cannot readily be evacuated. In this case, it is necessary to make an enlargement of the opening by incision; and when the situation of the wound is such, that the matter cannot have a free egress, a depending opening should be obtained if possible; as for example, suppose a wound

K 4

inflicted

* In such a putrid, gleetng state of a wound, whether after any considerable operation or otherwise, nothing is so efficacious as the *bark* with *elix. vitrioli*, when no circumstances forbid the use of it.—In a loose, flabby state of a wound or ulcer, I have seen great advantage from the use of a decoction prepared with *cort. peruvian*, & *fol. jugland*, adding a little sugar and *tinct. myrrhæ*, dressing them with lint moistened in it, and applied moderately warm. Or this, *R. aq. calcis fls tinct. cort. peruv. ʒ ii tinct. myrrhæ ʒ j m.* To which I have sometimes added *aq. vitriolic. camphorat.*

inflicted in the leg, descending a good way down, without the weapon's, piercing outwardly below, we may first attempt, by expulsive compress and bandage, to press up the matter, in order to be discharged at the orifice, for which purpose, a plaster compress is the most proper, with a piece of thin sheet-lead, such as tea comes home in, put into the middle of it, as it will not be apt to slip from its fixed place, and will make due resistance: but if the end cannot be effected by this method, and the lower part of the wound is near enough the external teguments, it is advisable to make an opening there, without delay; applying a compress above, and allowing the superior orifice to close. This depending opening is to be made, by introducing a probe or other convenient instrument, cutting upon it with a knife or lancet; or by an instrument invented by *Monf. Petit*, which answers the purpose better on some occasions; it is described by *Heister* in his *System of Surgery*, Pl. 4. with his improvements upon it. After making an opening in this manner, in the most depending part, and sufficiently dilating it, we sometimes

sometimes find it necessary to draw a seton through, from the superior to the inferior orifice, continuing the use of it for some time, or to inject with a small ivory syringe, or drop in some kind of vulnerary absterfive medicine, such as the balsam, p. 139, in order to bring the parts into a disposition to admit of union by compression, or to fill it up with good flesh.

Cicatrization is the intention, as we have said, that finishes the cure, about which we should be particularly careful, especially when the wound happens to be upon a part that is exposed to view. The main point to effect the purpose of leaving a fair and smooth cicatrix, in healing a wound with great loss of substance, depends on the former part of the treatment, in filling the wound up with good and sound flesh, and that to an equal height, or very nearly level with the adjacent skin: when the incarnation is so far advanced, the wound may be cicatrized, with dry lint and moderate compression, or with *cerat. epulotic.* suppressing any luxuriancy of flesh occasionally, with gentle touches of *lap. vitriol.* or *caust. lunare*, till the cicatrization

trization is completed. Of all wounds, burns require the most care to induce a seemly cicatrix.

Sometimes the new-made skin will have vesications arise upon it, especially where there has been a great loss of substance, till that and the regenerated flesh is perfectly organized, to admit of a free and uninterrupted course of the fluids through the vascular *compages* ; which vesications are to be opened, as soon as they appear, to prevent erosion by the matter contained in them, and then dressed after the common manner with *cerate* alone, or mixed with a little digestive, by which means they will soon be healed.

OF APPLICATIONS USED TO ANSWER THE
DIFFERENT INTENTIONS IN CURING
WOUNDS.

THE medicines called digestives, which have also a deterfive quality, and may, with propriety enough, have the appellation of incarnatives given them, are fuch as we have already mentioned, as *unguent. basilic. flav. unguent. e gum. elemi*, &c. When a soft balsam is thought necessary, either in deep, or other wounds, this may be used; of which I have long experienced the good effects.

R. Vini alb. generos.

Ol. Olivæ. optim. a. ℥iv

coq. ad consumptionem dimidii dein add.

Unguent. e Gum. Elemi

Balsam. e Copaib. veri a. ℥j. m.

℥ col. ℥ in phiala, lato ore, servetur.

This balsam is very convenient to be added occasionally to the above-mentioned digestives, when it is required to have them of a softer consistence; and exceedingly well adapted to pass into deep wounds, or to dip
setons

setons into, when used as directed, after making counter openings. Sometimes I add a portion of *tinct. myrrhæ* to it, which by shaking, incorporates well with it. *Unguent. basilic. viride* is a good detergent. *Tinct. myrrhæ & aloës* is much commended by some. *Merc. præcip. rub. benè. lavigat.* is often used either alone, or in composition with the digestive, and generally observed to meliorate the matter when thin and sanious.—Desiccative applications are of various kinds, as *cerat. epulotic. cerat. saturnin. &c.* concerning which, practical writers may be consulted.—Corrosives and escharotics, used in destroying fungous flesh, are *alum.* and *vitriol. ust. vitriol. roman. caust. lunare, lap. infernal. &c.* but by beginning early to dress with dry lint, there will not be much occasion for these painful applications. By fixing *lap. vitriol.* or *caust. lunare* into quills with sealing-wax, they may be used much more commodiously.*

OF

* See dissertations concerning the different kinds of applications used in the cure of wounds, in *Recueil de Pièces de l'Acad. Roy de Chirurg.*

OF BANDAGES AND SUTURES.

AFTER having attended to the different kinds of wounds, and the intentions in curing them, we shall now specify the bandages and sutures, as far as they are necessary and subservient to those purposes. The technical bandages of use in wounds, are the uniting, the retentive, and the expulsive; and that called the tailed-bandage, used in compound fractures, will be found very proper upon some occasions in other wounds.*

The

The opposite caustics, so termed and recommended by doctor *Barry* in the *Med. Ess.* is a very powerful method, to destroy large fungi, performed by alternate touches of *lap. infern.* & *ol. vitrioli*, as long as shall be found necessary. It was practised by *Wiseman* for the same purpose, and I did the same, a great many years ago, upon his authority, and often since, with great advantage.—The *eau mercurielle* of *Le Dran* is a very efficacious application, to answer the same end, which is a solution of *merc. crud. p. i. in aq. fort. p. ii.* I have frequently experienced the use of this also much to my satisfaction; so have many of my brethren upon my recommendation.—See ulcers with carious bones, in Vol. III.

* See the advantage of this bandage, in simple as well as compound fractures, in Vol. II.

The uniting bandage, used in rectilinear wounds, is made with a double-headed roller, of a fit length and breadth, according to the part it is to be applied upon, having a longitudinal slit cut in the middle, of three or four inches length. After dressing the wound, as has been directed, compresses are to be applied on each side of it, in such a manner, as to press from the very bottom to the lips or edges of the wound, before the application of the roller ; which, by having one head pass through the slit, will give an opportunity of drawing the lips of the wound together, as may be easily conceived. Sometimes it may be found necessary to place pieces of stiff paper upon, or wrapt up in, the compresses, or to use plaster-compresses, made as have been directed, that the bandage may act more equally and powerfully.—When wounds are stitched, this bandage is also very useful, in order to support the stitches, and prevent their breaking out, before the agglutination of the wound is accomplished.*

When

* Mr. *Dent*, an ingenious surgeon at *Dublin*, invented, a few years ago, an uniting bandage for the hare-lip, in
Order

When we make use of a single-headed roller, as a retentive bandage only, we should always remember to begin the application of it on the side opposite to the wound; the reason is obvious enough, in order to prevent a farther separation of the lips of the wound, as the contrary manner of applying it, tends directly to divide them.

The expulsive bandage is performed with a single headed-roller, making the pressure gradually less, by small and even edgings from the bottom of the wound to its orifice; spending the rest in such a manner, as the surgeon's discretion and judgment shall direct, to have the whole sit easy upon the part, without interruption to the reflux blood.

The double-headed roller, the triangular, and quadrangular bandages, so called from their figure, are those frequently used in
wounds

order to prevent uneasy pressure upon the pins, made by thirty or forty threads passing between each other, the necessary space in the middle of the fillet: and such a kind of bandage, of a proportionate size, may have its use in other parts, to make the pressure more even and equal upon the compresses.

wounds of the head. The roller must be applied artfully, so as to lie smooth and even upon the part, in necessary circulars and reflexers; it should not be full four inches broad, have neither selvage nor hem, and be six or eight yards long, made of soft cloth. This is called by the writers on this subject, the *capeline*, or reflex bandage.—The triangular bandage is made with a handkerchief, or square cloth of a proper size, doubled into that figure, which makes a very useful bandage, for wounds of the forehead, and some other parts of the head.—The quadrangular is made of soft cloth, about three feet square, or a little longer than broad, which is an excellent bandage for the head. It is called by the *French*, *le grand couvre-chef*; the application of it may be learnt from *Heister*, and other writers, upon this useful branch of surgery; for it is beside the present purpose to treat professedly of bandages, which the moderns have wisely endeavoured to reduce into a narrow compass, many of them, mentioned by the ancients, and those of the last century, serving only to perplex our art; and ingenious men will

will exercise their invention upon extraordinary occasions : but the application of bandages cannot well be learnt by verbal description without *autopsy* and practice.—Great care is required in the application of them ; for when made too strait bad consequences may ensue.

OF SUTURES.

THE second manner of keeping the parts in contact, that were separated, is by futures. The five kinds now in use are, 1. The dry future. 2. The twisted, used in the hair-lip, and such like wounds. 3. The interrupted. 4. The quilled. 5. The spiral, or the glover's. But stitching of wounds, as we have hinted, is not so generally practised, by the ablest surgeons, as it used to be in the last and former ages.

The dry-future, is made by two pieces of sticking-plaster, proportioned to the size of the wound, to which very narrow tapes are to be fixed, at due distances. After the hair is shaven off the part, as close as possible, the

plasters are to be applied at small distances from the lips of the wound, which are then to be brought gently and equably together, and covered with an even pledget of some vulnerary balsam, as before directed, retaining them in contact, or as nearly so as possible, by tying the tapes with great exactness, taking particular care to have them correspond with each other on the opposite sides; and they should be tied with slipping knots, that they may be readily straitened or loosened occasionally. Instead of tying the tapes, they may be made to pass through slits, like the uniting bandage, and then secured with very fine pins; or strips of plaster may be used to answer the same purpose, which I have found succeed very well. There is another method of making the dry-future, with only one piece of plaster, having longitudinal holes cut in it, at a proper distance from one another, which give an opportunity of examining the state of the wound, and applying dressings the better to it, as shall be found requisite. It is made by fastening the plaster first, well on one side of the wound, bringing the lips of it gently together, as
already

already directed, and then applying and fixing it carefully to the other, dressing the wound over the opening of the plaster. This kind of future is of use in any part, but more particularly in wounds of the face, to prevent deformation, from the needle and ligature.

After these futures, it is advisable to apply easy compresses and the uniting bandage, when they can be conveniently adapted to the part, in order to assist and support the plasters, in keeping the lips of the wound in apposition ; and it will be necessary to attend diligently to the state of the wound, from time to time, and straiten or slacken the future and bandage, renewing or continuing the old dressing, according to appearances of the wound and adjacent parts, till the union of it is perfected, which will sometimes be in a few days. The time generally allowed for the union of wounds, of any considerable size, is ten or twelve days ; but more superficial ones often unite in three or four. When we have reason to believe the union is completed, the plasters are to be carefully removed ; though commonly the moisture

proceeding from the wound, insinuates itself between them and the skin, making them easy to be taken off, and a renewal of them necessary sometimes, before the union of the wound is effected ; under which circumstance, great care is required to have the parts kept together, by a proper assistant, whilst we are taking off the old useless plasters, and applying the new.

I have used the following method in some large incised wounds, with a good effect, in preventing the recession of their lips. Instead of the single pieces of plaster, adapted to the parts, as in the dry-future, I have put five or six pieces of plaster together, with a piece of thin sheet-lead in the middle, as described before, in making plaster-compresses ; and after fixing them exactly, as directed, near the lips of the wound, carried a sufficient number of narrow strips of the same plaster over them, passing them through slits, like the uniting bandage, returning the ends over these compresses ; and by their adhesion all together, they will prove a powerful means of answering the design. I have found by experience, that half the quantity of resin,

lin, directed in the Dispensatory to be added to the *emplast. commun.* makes it adhesive enough for these purposes, nay, that it is so even without the addition of any resin, if the plaster is well made.

The twisted suture, used in the hair-lip, and in the total division of pendulous parts, as the ear, the nose, &c. is performed by introducing one, two, or more, needles or pins through the whole substance of the lips of the wound, twisting a waxed thread neatly about them, in the form of a figure of 8. The needles or pins are to be chosen longer or shorter, as the circumstances of the wound direct; in order to introduce them, the lips of the wound are to be held firmly, with the finger and thumb, which is a better method in general, than to use the stitching quill, as directed by some surgeons; care must be particularly taken, to enter the needles or pins at a sufficient distance from the edge of wound, making them pass quite through, and out at the same distance on the opposite side, that they may not be apt to cut their way out, before the wound is well consolidated. When they are thus introduced, we

are to wind a ligature, as has been described, in the cross manner that taylor's fix a needle and thread upon their sleeves; or we may make one ligature serve for all. After this, we are to take off the points of the needles or pins with incisive pincers,* fixing little compresses, made with snips of common plaster, under the ends of them on each side, applying to the wound a pledget armed with some vulnerary balsam, not apt to produce matter, but of the most agglutinating nature, and a common plaster over it, with easy compresses and the uniting bandage, where they can be commodiously used, for the same reasons, as given in the application of the dry-future. The wound is to be dressed in this manner, at such distances of time, as shall be found necessary, but it does not require daily dressing, which possibly might interrupt the union of it; when that is effected, the needles or pins are to be cautiously

* Silver-pins may be had of the instrument-makers, with steel points, screwing and taking out easily, by which this inconvenience may be obviated.—See *Monf. Louis's Dissertation upon this subject, in Mem. de l'Acad. Roi, de Chirurgie, tom. 4.*

tionously withdrawn, still continuing some proper application, till the holes made by them be filled up.

The interrupted future comes more generally into practice than the other. It is performed with a needle of a proper size, as the nature of the wound directs, threaded with flat waxed ligature, by thrusting it through both lips of the wound, with or without the help of a stitching-quill; bringing them together, in the manner directed in the dry-future, and keeping them so, by tying the ligatures with slipping knots, that they may also be occasionally loosened or straitened; making a number of stitches, according to the length of the wound, at the distance of near an inch from each other. In superficial wounds, needles of the least curvature are properest; in deep wounds they must be curved in proportion. In such a case, the needle must be thrust down to the bottom of the wound, and if it is a very deep one, from without inwards, taking out the needle, and from within outwards; observing that the punctures correspond, and be made at due distances from the edges of the wound, that

the ligature may not cut through too soon ; but if it is not a deep wound, both lips may be pierced at one thrust, without taking out the needle. When the wound is deep, the teguments thick and tough, and the operator's fingers bloody, he may find it difficult to push the needle through ; then *Petit's port d'aiguille*, described by *Garengéot* in his *Traité des Instrumens de Chirurgie* may be useful ; but in general, the fingers will fully answer the purpose, without that assistance. When there is a necessity of making more stitches than one, we should begin next to one end, rather than in the middle of the wound, always remembering to make the surgeon's knot or noose, that the ligatures may be easily loosened, in case pain or inflammation should make it necessary. The wound itself is to be treated, as has been already directed, making such other applications, as may most effectually prevent pain, inflammation, &c. not forgetting to apply a very easy compress and gentle bandage ; here also, compresses on each side the wound, and the uniting bandage, may prove very useful and subservient to the stitching. We should not
suffer

suffer the stitches to remain longer than it is necessary in the wound, because the ligatures, cutting the flesh and skin, may leave pretty large holes, sometimes proving troublesome to cure, besides adding to the deformity of the scar, which should be avoided, as much as we can, for the patient's security, and our own credit.

The quilled-suture is seldom made use of, but in *gastroraphy*, for large extensive wounds in the *abdomen*, though it may, without impropriety, be used in such wounds, in other parts of the body, when we have reason to fear the ligatures, in the interrupted suture, should cut quite through too soon, by the strong recession of their lips; but as we shall be obliged to mention it in wounds of the *abdomen*, we shall defer the description of it till then.

The glover's, spiral, or continued, suture, is now only used in wounds of the intestines or stomach, the description of which, therefore, in course, comes under the same article as the last.

Sutures are to be used only in clean, recent wounds, as we have observed on *symphysis*,
where

where no large blood-vessel is cut ; for confinement of blood in the wound might produce bad symptoms, as inflammation, &c. and to practise them in old wounds would be attended with as bad consequences, by detaining the matter that should be evacuated, and so retard the healing. Sutures are improper in contused wounds ; for the contused parts in a wound must separate and be digested off, before nature can perform her part in the cure ; the same reason holds good, when the wound is internally cruised over : and when there is a great loss of substance, stitching would be evidently wrong, as, by it, the parts would be put too much upon the stretch, causing great pain in bringing the lips of the wound together ; and could they be so united, the cicatrix probably would appear so puckered and deformed, as to bring a reproach upon the surgeon. We are not to attempt stitching a wound, where there is a manifest hazard of puncturing a large vessel ; we are also to reject this practice, if there is an inflammation, or tension of the parts, for under such circumstances, it would certainly increase the symptoms, and
might

might prove fatal in a bad habit of body. If there is reason to apprehend an extraneous body lies latent, no caution against stitching is wanting. To stitch a poisoned wound would be destructive practice. And futures are not advisable, except under particular circumstances, upon parts that are in continual motion, as the *thorax* and *abdomen*; for by the involuntary motion of respiration, the stitches might not only soon be rendered useless, or break out, but the wound be made worse, than it would have been without stitching: however, the dry-future, or strips of adhesive plaster, to keep the lips of the wound from receding, are proper, and may prove very beneficial on that account.*

From what has been said, we see what wounds are curable by *symplysis*, and what by *syssarcosis*, and how far bandages and futures are necessary aids in the cure of wounds. Now we shall consider and direct, more particularly, the treatment of wounds of different parts of the body; as of the arteries, veins,

* In *Heister's* system of surgery, we find plates that clearly describe the various kinds of futures, as well as bandages.

veins, lymphatics, nerves, and tendons, reserving those of the membranes and ligaments, till we come to wounds of the joints, towards the conclusion.

An artery is an extensible, elastic tube, consisting of three coats, made up of fibres in different directions; the external is connected to the surrounding parts by cellular membrane, and consists of fibres, running in every direction; the fibres of the second are longitudinal, and those of the internal are circular. By this construction, it is capable of dilatation and contraction, lengthening and shortening, to answer many purposes of importance in the animal œconomy.

We shall begin with the cure of a wound in a small artery. When it is totally divided, in any external part of the body, it retracts into the neighbouring parts, as we have observed before, the *hæmorrhage* generally stopping of itself, and differs not from a simple wound, as we have described; but when such a vessel happens to be punctured, or only partially divided, according to our second supposition, the ensuing *hæmorrhage* may

may prove of long duration ; in which case, if it can easily be come at, without injuring any considerable part, it is to be totally divided, which reduces it to the state of a simple wound ; or the wound must be sufficiently enlarged, by a longitudinal incision, to make room for applications, and then dry lint or *puff-ball*, lint moistened in a *vitriolic* solution, or the white of an egg, dipping it into flour, or some such application, carefully applied, with compress and bandage, will generally answer the purpose effectually : or the needle and ligature may now be used. After the *hæmorrhage* is restrained, the wound is to be treated in the common manner.

When a considerable branch of the *femoral*, or *brachial* artery, in the leg or cubit, is wounded, the effusion of blood, unless speedily restrained, may bring the patient's life into danger ; on which occasion, various methods are proposed and practised, as by compression, styptics, escharotics, the actual cautery, and the needle and ligature, which is preferable to the other, from its greater security,

security, when it can conveniently be used.*

When we would rely upon compression, after the application of a sufficient quantity of lint, or other soft substance, with or without a *styptic*, to the mouth of the vessel, the best and most effectual compress is made with pieces of plaster, interposing a piece of card, stiff paper, or thin sheet-lead, giving it such figure and dimensions, as we find best adapted to the purpose, in order to have the bearing

* *Paré* was the first who used the needle and ligature in amputations; but he was not acquainted with the curved needle; therefore was forced to pass his needle from the vessel to the edge of the stump; including some of the skin in the ligature. His practice was opposed with all the acrimony that prejudice could suggest, particularly by *Gourmelin*, a doctor of the faculty at *Paris*, where physicians and surgeons have been at variance many centuries, which discord made *Lanfranc*, an eminent practitioner there, both in physic and surgery, who had been educated at the famous *Salernian* school, express himself in this exclamatory manner. “*O Deus! quare sit hodie tanta differentia inter physicum & chirurgum?*—— See *Histoire de l'Origine & des Progrès de la Chirurgie en France*, which was published upon the establishment of the Royal Acad. of Surgery, at *Paris*.

bearing made, by the bandage, directly perpendicular upon the wounded vessel; endeavouring to leave the adjacent parts, as free as possible from circular pressure, which tends to increase the *hæmorrhage*, and produce other bad symptoms; but in order to obviate those inconveniences, thick compresses of cloth, with stiff paper on the outside, may be applied over the part, and to the opposite side of the limb, which will leave room for the circulation of the blood through it, without any prejudicial interruption, though a proper degree of pressure be made with the roller; which should be double-headed, passing through a slit upon the superior compress, as directed in the uniting bandage, by which means the force may be increased more commodiously, without hazard of its slipping.—The bandage, &c. must be varied, according to the different parts, and circumstances attending the *hæmorrhage*, in which respects, the surgeon must exercise his genius and invention: or a machine may be constructed, in case of emergency, upon the principles of that in my observations, or like that in *Heister*, &c. when we happen to be in a place,

place, where we can meet with a proper workman.—We find compression alone infallibly answers the end, when there is a bone to counteract it, immediately under the wounded vessel, as daily experience shows, in opening the *temporal* artery, where dry lint and a plaster compress, having a piece of card or stiff paper in it, with the well adapted *nodoſe* bandage, are all that is necessary to restrain the bleeding after this operation. This bandage is made with a fillet or roller, about four yards long, and near an inch and an half broad, with two heads, which are to be reversed two or three times, forming knots in order upon the compress. This kind of bandage may have its use sometimes in other parts, as I have frequently experienced, as well as upon this occasion.

There have been a great many *ſtyptics* published, and boasted of as infallible, which, upon trial, have not answered the encomiums given them, but much disappointed the surgeon's hopes and expectations; and indeed it is running too much risk, to rely absolutely upon them in wounds of the large arteries. As to the use of fungous substances, which

is a very ancient practice in *hæmorrhages*, I think, something very considerable may be reasonably expected from them, when exactly applied to the mouth of the bleeding vessel, with powerful compression, without which, the surgeon's expectations will, in all probability, be frustrated. That kind, which I have often used, and prefer to all the rest, is the *crepitus lupi*, called also *lycoperdon*, *puff-ball*, *mullipuff*, or *bovist*, by the botanic writers. This plant grows frequently in pasture-grounds, to the size of a pompion, which it resembles in form; till its full growth, it is white, like a mushroom, and of such texture; then gradually grows brown, becoming a very soft substance in autumn, which is the time of gathering it for surgical use, sooner or later according to the season.

As I have found this fungous substance a very useful application, on many occasions, I am not willing to suppress what I know of its efficacy, from my own experience, which I shall relate, after giving a short account of the opinion of others concerning it. *Felix Wurtz* commends it.—*Schroder* calls it

fungus chirurgorum.—*Clusius* says it is very efficacious in stopping effusions of blood.—*Baubine* says the same.—*Heister* speaks of it, as a thing much in use for this purpose.—*Ray*, in his *Synopsis method. Stirp. britan.* after describing the plant, says, “*Hæc* “*substantia vulneribus, ubi siccata fuit, imponi* “*solet, pro sanguinis fluxu cobibendo.*” And I think *Boerhaave* recommends it on this occasion.

It is a softer application, and more absorbent than lint, which considerations have induced me to use it often after amputations, instead of lint, applying it in smooth, even slices; and after extirpating several breasts, and large tumours, where the vessels have not been large, I have used it with moderate pressure, without finding any necessity for the needle and ligature. I have also found it of singular service in *bleeding cancers*, by its constantly stopping the effusion of blood, with gentle compression, exciting no pain, which is to be looked upon as a happy circumstance, in such deplorable cases.—Perhaps slices of this, applied to stumps, might answer the end proposed by Mr. *Kirkland*, in
the

the 2d vol. of the *London Medical Observations and Inquiries*, of absorbing the matter, instead of sponge, recommended by him, in order to prevent a reflux of it.—This substance may be made more compact, by putting it into a press ; and so prepared, seems fitter for some purposes ; as for instance, suppose a vessel, opened in a part where it cannot be come at with the needle, and would be dangerous to apply an *escharotic*, a piece of suitable dimensions might be conveyed down to the bleeding vessel, filling the part up, so as to have strong compression made upon it, as we have directed, by hand or otherwise ; but the case may be so circumstanced, as we have hinted before, as to make the fingers the best, and indeed the only, compressive instruments, that can be admitted. As this substance, thus prepared, imbibes moisture, it will expand, and act more strongly upon the mouth of the vessel, if the compression is properly regulated ; and the distention of the surrounding vessels will, in some measure, promote this effect. This is the manner, that I apprehend fungous substances act in restraining *hæmorrhages*.

Eſcharotics are more powerful than ſtyptics or aſtringents ; for they deſtroy the life of the parts to which they are applied, inducing an *eſchar* or cruſt on the mouths of the bleeding veſſels ; but *ſtyptics* or aſtringents, according to the general meaning or acceptance of the words, ſignify no more than an exertion of their power by coagulating the blood, or leſſening the diameter of the veſſels, by putting their *fibres* upon contraction. The corroſive applications, uſed on theſe occaſions, cauſe exquisite pain, ſometimes throwing the patient into convulſions, when near nervous parts, eſpecially if they have *arſenic* in their compoſition, which ſome authors of no ſmall note have recommended ; and among the reſt, that great and deſervedly eſteemed practitioner ſerjeant *Wiſeman*, has run into this error. The leaſt dangerous of the claſs of *eſcharotics*, uſed in ſtopping *hæmorrhages*, is the *vitriolum romanum*, the ſingular good effect of which, Mr. *Layman* and I experienced, with the compreſſive machine, as related in my obſervations : but all theſe applications are attended with great inconveniences, beſides the pain, &c. which
they

they excite, as a return of the bleeding, when the *eschar* falls off; or destroying the adjacent parts, by which another artery, if it lies near, may be opened; and this unhappy effect was verified in the case, that *Boerhaave* used to mention to his pupils, of a young man at *Leyden*, who lost his life by such an incautious step.—Some years ago, I was called to an elderly woman, a fortnight after having had the *radial* artery divided, a little above the wrist, with a sharp-pointed knife, by the flapping of the wing of a turkey, as she was killing it. A surgeon, of but little experience, immediately plugged up the wound with some *styptic*, and so, from time to time, stopped the bleeding, by various applications; but the frequent returns of it exhausted the patient's strength, bringing her life into imminent danger. The painful applications caused great tumefaction, and inflammation of the whole limb, in which state I found her; and there appeared to me no other expedient left, but to apply the *tourniquet*, and dissect the parts, between the tendons, as far as necessary, to discover the bleeding vessel, which I did,

with some difficulty, the ends of the artery being considerably separated; but by the knife, with the assistance of the dissecting *forceps* and hook, I raised them sufficiently to convey ligatures about them, without injuring any of the neighbouring parts; which effectually stopped the effusion of blood: and the wound was healed by the common treatment, preserving the perfect use of the limb.

In consideration of such danger and inconvenience, attending the use of *escharotic* applications, some of the ablest surgeons have preferred the *actual cautery*, as the pain it creates is not of so long duration, and its effect more certainly limited, as well as quicker, when exactly directed to the mouth of the bleeding vessel, with the assistance of the *tourniquet*: and a *canula*, upon some occasions, will be found necessary to defend the neighbouring parts, and convey the *cautery* to the destined place more precisely. By touching the part artfully with the *cautery*, of a proper degree of heat, an *eschar* may soon be formed, to resist the force of the blood; gentle touches at first, quickly repeated,

peated, will be found to answer the end best ; forming the *eschar* gradually, is the most likely manner to make it sufficiently firm ; for should the *cautery* be kept on too long upon its first application, it may bring flesh away with it, and frustrate our design. . This I speak from experience.—A young gentleman, fighting a duel, received a thrust with a sword between the *radius* and *ulna*, whence proceeded a profuse *hæmorrhage*, proving beyond doubt, that the *median* artery was opened. After the application of a *styptic*, strait circular bandage was applied, upon which the bleeding increased, but abated upon removal of the bandage : however, the *actual cautery* was used, and effectually stopped the effusion of blood. In this case, we have a convincing proof of the ill effect of strait circular bandage, which, acting upon the *radial* and *ulnar* arteries, threw more blood, and with force in proportion, into the *median* in its progression, obstructing at the same time the reflux of the blood by the veins ; which causes conspired to increase the *hæmorrhage*.

The method of restraining *hæmorrhages* by the *actual cautery* is liable to the same objection, in respect to the hazard of future bleedings, upon the fall of the *eschar*, as that by an *escharotic*; of which the surgeons in former ages, before the use of the needle and ligature, were but too well convinced, by the loss of their patients; therefore should it be thought advisable to put such methods in practice, upon any emergency, in these days, the bandage and compresses, applied as before directed, should not be removed in less time than three or four days, or more, unless for particular reasons, to look at the wound, which must then be treated with the utmost care and gentleness, preserving a due degree of pressure upon the vessel at the same time, lest we should disturb the application that had been made to it, before it is ready to fall off; over which, for greater safety, it will still be right to apply *puff-ball*, prepared as directed, or some such substance, moistened in ardent spirits, to retard the fall of the *eschar* as long as possible, and resist the impetus of the blood with moderate pressure; and it should

should be continued after the *eschar* is fallen off, for some time, till we have good reason to believe the vessel is united, and firmly sealed up with flesh. The same application immediately made to the *eschar* produced by the *actual cautery*, assisted by the compresses and bandage recommended, I am well assured, will prove a good means of security, against a consequent *hæmorrhage*. We may remember, that the *actual cautery* is the only resource in *hæmorrhages*, in some parts, particularly in the mouth, as we have hinted before: and we must not forget, when we are called to a patient, on account of a profuse *hæmorrhage* upon a limb, to apply the *tourniquet* directly to restrain it, till a proper *apparatus* can be prepared. The *tourniquet** will be found absolutely necessary, to give an opportunity of making any kind of applications, with exactness, to the bleeding vessel, after well wiping away the blood with a sponge; and it should be kept on a little while after, letting

* Mr. Crane, one of the surgeons of St. Bartholomew's hospital, invented, a few years ago, an excellent *tourniquet*, superior to any I have seen, which should, by all means, be had in plenty in the army and navy.

letting it loose gradually, increasing the compression with the hand, at the same time, over the bandage and compress, for reasons too obvious to want explanation.

As the preceding methods are dangerous and precarious, the best surgeons now chuse the needle and ligature, where practicable, even though there should be a necessity of enlarging the wound, in order to come at the vessel; which method is more safe and certain in its effect, care being taken to avoid injuring any considerable parts. This operation is performed with a needle of a proper curve and size, threaded with a flat ligature waxed, made of shoe-maker's thread, which is the best material, when fine and even, to make ligatures of. The needle is to be introduced a little above and below the division or orifice of the vessel, and the ligature to be cut in the middle, after drawing it equally in; or ligatures may be passed in separately. The opening of the vessel will be easily discovered by loosening the *tourniquet-ligature*, when that can be used; and we must endeavour to avoid pricking or including nerves or tendons, which may be effected, when
not

not interrupted with blood, by raising the vessel a little, where it can be fairly brought in view, with the point of the knife and dissecting *forceps*, in an artful hand.* This wound is to be considered, as a recent *aneurysm*, and it is of the utmost consequence, to make two ligatures upon the artery; for the bleeding may readily continue from the lower part of the canal, by means of the communicant branches; as we may easily conceive, when we consider that the structure of the arterial system is without valves.† There are two instances in the *Philos. Transf.* from Mr. *Cowper*, a great anatomist and surgeon, in

* A hafted needle may prove a very useful instrument in this operation sometimes, having the eye near the point.

† See Mr. *Lambert's* method of stitching the artery in an *aneurysm*, in the 2d vol. of the *London Medical Observations and Inquiries*.—It is to be practised only in recent cases: and it may also be considered, how far two or three stitches of the spiral suture, made with a very fine flat needle, properly curved, may answer the like purpose.—The *port d'aiguille* may be found a necessary instrument in Mr. *Lambert's* method, and in making this suture, for very obvious reasons.

in his time, to enforce this attention.* After thus securing the wounded artery against future bleeding, the wound itself is to be treated in the common manner, with digestive,

* The violent charge against ligatures in amputations, I am persuaded, is not well founded, from the uninterrupted success I have had in a great number of instances, since I practised the method recommended in my observations, with no other bandage than strips of common plaster, and a knit woollen cap; whence I cannot help concluding, that the alarming symptoms which have been ascribed to the ligatures, principally arose from strait circular bandage. My friend doctor *Donald Monro*, to whom I am under very great obligations, has told me, that the surgeons of the Royal Infirmary at *Edinburgh* were astonished at the success attending amputations there, when they laid aside strait bandage, by his father's advice, whose authority cannot have too great weight in a matter of such concernment, as tends directly to obviate pain and preserve life: and the medical art is infinitely indebted to that gentleman.

Since I wrote these papers, I have observed, *Monf. Pouteau*, senior surgeon of the *Hôtel-Dieu*, at *Lyons*, in his *Melanges de Chirurgie*, printed in 1760, and *Mr. Kirckland*, an eminent surgeon in this kingdom, in his treatise upon suppressing *hæmorrhages* from divided arteries, published in 1763, differ in their sentiments from *Monf. Petit*, whose *hypothesis* is, that *hæmorrhages* are stopped af-

ter

tive, &c. applying gentle comprefs and bandage, making it only retentive, and fuffering the ligatures to become quite loofe, before the removal of them.

By whatever means the effufion of blood, proceeding from a wounded artery, is ftopped, if the patient is of a plethoric, fanguine habit, with a ftrong pulfe, venefection is above all things neceffary, in order to leffen the quantity, and weaken the impulfe of the blood, repeating it occasionally.* Upon the fame principles, we fhould prefcribe a cooling, fpare, diet, and laxatives, that ftimulate in the leaft degree, advifing the patient, by all means, to keep himfelf quiet, and his mind free from perturbation.—The ancients
laid

ter amputations by *coagula* of blood, formed feveral inches up the arteries, as appears in the *Mem. de l'Acad. Roy. des Sciences*. I have the fatisfaction to find the experiments, made by thefe two gentlemen, fully fupport my opinion upon this fubject, which I wifhed to have had an opportunity of making myfelf, when I publifhed it among fome cafes and remarks in furgery, in the year 1758.

* See *Hales's Hæmæftatics*.—Doctor Watts's Difertation on Revulfion and Derivation, is well worth reading.

laid great stress upon revulsion and derivation, even in wounds of the arteries externally, as we may observe in *Fabricius ab Aquapendente*, &c. but they are of much more consequence in *hæmorrhages*, from wounds of the internal vessels, as we shall show hereafter; when bleeding and every other means, that reason can suggest, should be employed to diminish the quantity of blood, and weaken its impelling force. Rest of the body should be very strictly enjoined, and the utmost endeavours used to keep the patient's mind easy, allowing no more food than barely to support life. What he eats should be of a cooling, incrustating, and agglutinating nature, and his drink should be of the subastringent kind, as *tinct. rosar.* red wine and water moderately acidulated with *spirit. vitriol.* &c. to be taken cold; not forgetting the prudent use of opiates, occasionally, to procure rest, and keeping the bowels open, by the gentlest means. In such cases, the *bark*, *alum* & *nitre*, from their well known properties, may also be administered with good advantage, according to the surgeon's discretion, when a regular physician

fician cannot be consulted. And in all great effusions of blood, whether internal or external, the patients should be kept in cool rooms, for very obvious reasons, considering the effect of heat in accelerating the circulation of the blood; and the position of the body and limbs, must be governed by the nature of the wound, and situation of the part.*

It may not be here unseasonable to introduce the treatment of *aneurysms*.

OF THE TREATMENT OF ANEURYSMS.

IN the treatment of wounds of the arteries, it has been observed, that when the trunk of an artery in a limb was wounded, loss of sensation, motion, and nutrition, proved the consequence of such an accident, which consideration induced authors to advise immediate amputation, at the wounded part; but in a wound of the *brachial* artery, far up the arm, when a pulsation is felt at the wrist, that

* See note hereafter upon the article of *hæmorrhage* in wounds;

that circumstance will justify treating the case according to the method proposed in pages 170, 171, or like the false *aneurysm*; for nature varies in the arterial system, and sometimes that artery is divided into two, long before it arrives at the joint; and I have seen an instance, where the division was just after leaving the *axilla*, the superior branch of it making the *radial*, and the other the *ulnar* and *median arteries*. Doctor *Hunter*, the most celebrated professor of anatomy that ever was in *London*, exhibits many arms, in his course of lectures, showing this *lusus naturæ*, at different distances from the joint. This gentleman's friendship and indulgence I shall ever remember with pleasure and gratitude, having been infinitely obliged to him for his kind and frequent communications.*

When the external coat of an artery is wounded, both the other yielding to the lateral

* *Formius*, a very eminent surgeon at *Montpelier*, communicated to his friend *Riverius* the cure of a wound, wherein the *brachial* artery was divided; and expressly says, he succeeded by ligature immediately after the accident. Vid. *Prax. Med. Riverii inter Observationes communicatas*.

teral preffure of the blood, it is to be considered, in the treatment of it, as a true *aneurysm*, which may proceed from any external injury weakening the artery, as we have before observed ; as whatever cause, be it external or internal, produces that effect, may give rise to the disease. The characteristics, or distinguishing signs, of the different kinds of *aneurysms*, have been specified in the *diagnosis*, pages 78, 79, 80, which should be well attended to, in order to prevent error of judgment, and consequently dangerous mistakes in practice. Upon the authority of serjeant *Wiseman*, *Hildanus*, *Tulpius*, &c. who were great practitioners and accurate observers, astringent applications, with compression, have been tried ; but as it is much to be feared, that a radical cure should not be effected by this method, perhaps, where it is practicable, as below the knee or elbow, it is more advisable to perform the operation, as will presently be directed ; for should the tumour be suffered to increase, and happen to burst suddenly, having no proper assistance at hand, it would more endanger the patient's life.

When the operation is thought advisable, it is to be thus performed, after preparing the patient by bleeding, gentle purging, proper diet, &c. if it does not require to be instantly done, and time can be allowed for the observance of these preparatory rules, generally necessary before any capital operation; otherwise they must be attended to immediately after, as the surgeon sees occasion. The patient being placed in a good position and light, having the limb rested steadily upon a table of a suitable height, the *apparatus* and assistants disposed in order, and the *tourniquet* applied, a longitudinal incision is to be made into the tumour, the full length of it; and it may be requisite to cut out an oval piece, as in opening a large abscess, in order to give an opportunity of removing the grumous or coriaceous blood the better with the fingers or proper instruments, and sponges squeezed out of warm water and brandy, that the sound parts of the artery may be come at the more commodiously, to pass the ligatures above and below the diseased part with a needle properly curved, either with or without a haft. If the ligatures cannot be conveniently

niently passed, without hazard of including or puncturing the vein or nerve accompanying the artery, it is to be carefully separated from them, with the point of the knife, when raised by the dissecting *forceps* or hook. After having tied the ligatures securely, which will be known by loosening the *tourniquet*, the next step to be taken, or omitted, at the surgeon's discretion, as circumstances shall direct, is to dissect away as much of the diseased artery between the ligatures, as can be done without injuring the adjacent parts, suffering the rest to be thrown off in the course of digestion. Other two ligatures may be conveyed in at the same time the operation is performed, in order to obviate perplexity, should a consequent bleeding happen; leaving them loose, to be used occasionally, if either of the other should slip or lose its power. This is a precaution that should not be omitted: I once saw this omission attended with such inconvenience, as I would willingly guard against.

We must speak with diffidence, in respect to the use of *styptics* in this case, which some surgeons have recommended and relied on,

stead of the ligature ; but I have good reason to believe, the *puff-ball*, prepared as directed, and applied exactly to the mouths of the vessel, after cutting away the diseased part, raising it above the surface of the wound, *stratum super stratum*, might effectually answer the end in some cases, with a due degree of perpendicular pressure ; avoiding strait circular bandage, by the method which has been described, in the article of stopping blood by compression ; but the ligature is the safest practice, therefore preferable when it can be used conveniently.

After the operation, the wound is to be treated in the common manner, allowing the ligatures, and all the dressings, to become quite loose, by digestion, before removal of them, using such easy compress and bandage as have been recommended.

When a true *aneurysm* happens to be formed near the trunk of the body, where no operation can be practised, a bole plaster, or some such astringent application, with a soft, easy, and well adapted compress, observing a strict regimen, and living upon a cooling diet, and bleeding now and then occasionally,

caſionally, as an increaſed ſenſation of throbbing, or other ſymptoms may indicate ; keeping the bowels open, and avoiding all violent agitation of body or mind, is the proper palliative method, to prevent its more ſpeedy progreſs ; and nothing more is to be done under ſuch deplorable circumſtances.*

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A falſe

* Some years ago I was deſired to ſee a tumour juſt beneath the *clavicle* of a young man, that evidently appeared to be an *aneuryſm* of the *ſubclavian* artery ; in which caſe much preſſure gave pain, but a gentle bandage, with a well adapted compreſs, made concave according to the convexity of the tumour, and very ſoft, gave him eaſe, and proved of conſiderable uſe. This patient died ſome years after of a fever, and I had not the opportunity of inſpecting the parts, to trace the extent of the *aneuryſm*.

My opinion was lately aſked by an elderly gentlewoman, of a ſtrong conſtitution and rather corpulent, concerning a very viſible pulſation of the *aorta aſcendens*, in the hollow juſt above the *ſternum*. In all other reſpects, except now and then a ſlight uneaſy ſenſation in the *thorax*, and difficulty of breathing for a ſhort duration, ſhe enjoys a good ſtate of health, and cannot aſſign any cauſe for the diſorder, nor recollect when ſhe firſt obſerved it. There is not yet any appearance of ſwelling externally, but it may be conſidered as an incipient *aneuryſm*.

A false *aneurysm* is occasioned, as has been described, by wounding all the coats of an artery; which most frequently happens in letting blood, a branch of the *brachial* artery, which generally divides at the bending of the arm, or just' below it, often lying so superficially, near the *basilic* vein, that its pulsation may be easily felt and sometimes seen, as has been remarked in the *diagnosis*; which monitory intimation should be remembered in venesection, to put the operator upon feeling for the pulsation, in order to avoid such an unfortunate accident, as has happened to skilful surgeons, through haste or inattention. The orifice of the vein closing, though not in the artery, the blood coming from it, is pent in, consequently must diffuse and insinuate itself into the *cellular* membrane, and interfices of the muscles, where it meets with least resistance. This kind of *aneurysm* requires the operation, as has been directed, without delay, to obviate the fatal consequences that may attend procrastination.*

When

* Four such cases have fallen under my care, two of them in a recent state, the other of long standing and very

When the tumour, proceeding from this kind of *aneurysm*, is become very extensive, through neglect, the wound, in the operation, must be made ample in proportion, to give room to cleanse the parts well from the grumous blood ; and after securing the bleeding vessel by ligatures, as has been directed, the wound is to be dressed and cured accord-

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ing

very threatening ; but all succeeded so happily, that the patients have the perfect use of their limbs.

See the case described by doctor *Hunter*, in the *London Medical Obs. and Inq.* vol. 2. nothing similar to it having been taken notice of before, in which the artery was wounded through the vein in bleeding, giving such appearances.

Lazarus Riverius, a celebrated professor of physic at the university of *Montpelier*, more than a century ago, says he cured a child, five years old, of an *aneurysm* caused by bleeding, with astringent applications, compress, and bandage. Vid. *Prax. Med. Cent.* 3. *Obs.* 43.—*Pomeret* and *Formius*, two very skilful surgeons, were concerned together, for a woman with an *aneurysm* in her arm, which proceeded from bleeding. She would not consent to the operation, in the usual manner, by ligature, as they at first proposed ; but when the tumour was increased to a great size under other means, it burst of its own accord ; and though they then cured the patient, yet the joint ever after remained immovably fixt. Vid. *Observationes ad Riverium communicatas.*

ing to general rules ; but should a mortification have supervened, that must be particularly attended to, and treated accordingly, with an *antiseptic* fomentation, digestives a little more animated than ordinary, applying them moderately hot, but not to excite pain, wrapping the whole limb up in a warm *cataplasn*, prepared with the fomenting liquor, *farin. bord. & aven.* and *spec. pro cataplasmate e cymino*, which mixes up with the meals more uniformly, and with less trouble, into a proper consistence, than by adding a portion of the *cataplasn. e cymino*, and I think, makes a better application than this *cataplasn* alone, which is commonly made use of for the same purpose ; and it should be remembered, not to apply it of a greater degree of heat, than gives a pleasing sensation of warmth to the limb. Under this circumstance, prescribing the *bark* should not be forgotten, when nothing contraindicates the use of that efficacious remedy ; joining *serpentar.* with it occasionally, and giving *camphire* and volatiles at the same time, if the patient is very languid,

Wounds of the veins require no particular treatment; the *hæmorrhage* is generally suppressed, without any difficulty, by dry lint or *puff-ball*, with proper compress and bandage, and they are to be cured as other wounds in common.* But though the ligature has little to do in these kinds of wounds, yet, upon a supposition of the internal *jugular* being divided, in a wound of the neck, and it can be conveniently come at to pass a ligature about it, it is advisable, upon the upper part only; two are not required, as in an artery, for obvious reasons.

The cure of wounds of the *lymphatics* comes next in order to be considered; whence sometimes proceeds an abundant discharge, as we have observed in the *diagnosis*. Lint or *puff-ball*, moistened in *alcohol vini*, or a solution of *alum* and *sacchar. saturni* in *aq. calc.* & *alcohol vini p. æ.* will generally answer the purpose, when carefully applied with

* *Varices*, which are dilatations of the veins, sometimes become very large and painful upon the legs, requiring opening, or even cutting quite away; which practice I have several times found necessary, and attended with a good effect.

with good compression and but seldom dressing, as I have found by repeated experience. Upon the authority of a very eminent man, the needle and ligature may be advantageously used ; and this practice I have also found successful, where the vessel could be well included ; but when this limpid effusion comes from a wound of the *parotid*, or other *salivary glands*, the above-mentioned treatment must be continued, till the vessels collapse, and the generation of flesh stops their leaks ; then the wound requires only common management to heal it.*

When

* About a year ago an elderly gentleman came to me, on account of a wound which he had received three weeks before upon his wrist, just above the *pisiform* bone, wherein the tendons were laid bare. The wound was now in a foul, bad condition, attended with great pain and inflammation, and had been very improperly treated by a pretender to surgery, who made very light of it. All the way from this wound I could trace a *lymphatic*, lying rigid like a very small cord in the *cellular membrane*, immediately under the skin, till it sunk into the *axillary gland* : and in the whole course of it there was some tenderness, with a slight degree of inflammation, not extending more than a few lines beyond it. An emollient embrocation soon removed the rigidity of the *lymphatic*,
the

When the nerves or tendons are punctured, partially or totally divided, they demand more attention than wounds of the fleshy parts; in order to prevent pain and inflammation, by emollient fomentations, cataplasms, embrocations, &c. The most suitable applications to the nervous or tendinous part itself, extending no farther, are those of a subtil, spirituous nature, such as *sp. terebinth*, dressing the other parts of the wound with vulnerary balsams, as has been directed. The congruity of the applications may be known, in a good measure, by the agreeable and pleasing sensation of warmth they give to the parts, without creating pain. Upon this head we may consult *Ruyfch*, *Meck'ren*, *Fab. ab Aquapendente*, *Wiseman*, and other practical

the tenderness and inflammation, after the wound was made easy by lenient dressings; and the cure was effected without any difficulty, by the quite contrary treatment to that which had been practised.

See note in pag. 9 of doctor *Hunter's* Dissertation upon the *lymphatic vessels*, in his *Medical Commentaries*, relating to doctor *Macauley's* case.—And histories of the cure of *lymphatics* opened in wounds, by professor *Monro*, in *Med. Essays*, vol. 5.—Also see Mr. *Hewson's* accurate Treatise on the *Lymphatic System*.

cal writers. Some authors have recommended *euphorbium*, and such acrid applications, to the exposed nerves and tendons, but they are dangerous, and may prove of fatal consequence ; as *Hollerius* and others testify. When the wound is too small to admit of applications directly to the nerve or tendon itself, it will be right to enlarge it for that purpose, and to give room for a free discharge of such acrimonious matter, as these wounds are apt to produce. It sometimes happens, that a train of direful symptoms attend a puncture or partial division of a nerve or tendon, making it absolutely necessary to divide them totally, in order to save the patient's life ; of which we have instances, upon good authority, to encourage the practice ; yet, as the total division of them may deprive some material part of sensation and motion, this consideration should engage our earliest and closest attention to the rules just mentioned, to prevent the necessity of taking such a step. In wounds of these parts, the limb must be put into such a position, that they may suffer as little divulsion as possible. More than ordinary care should be taken to
avoid

avoid exposing those wounds to the cold air. No oleaginous or cold applications should be made to them: and it is most advisable to use the fomentation before the removal of the dressings; as through them it will give a genial warmth, and have its proper effect, without exposing the wound to the influence of the air; but notwithstanding all precaution, a slough, thicker or thinner, will be superinduced upon the tendon, which the terebinthinous application will digest off, better than any I know; and then the wound will soon be healed by the common treatment.*

Authors

* *Augenius* writes of a taylor, who died in consequence of a prick with his needle, between the nail and flesh at the end of his thumb.

Amatus Lusitanus mentions a similar case, in an old woman, which was attended with convulsions, &c.

Glandorpius relates a case, where the tendon not being totally divided, dreadful symptoms ensued, which ceased upon the total division of it, after all other means were tried in vain.

The same author also gives us this memorable history. A nobleman, of a *cachochymic* habit, and infected with the *lues venerea*, received a wound into a nerve in a duel, which was soon attended with pain, fever, delirium, &c.

At

Authors, before those of the present age, have recommended stitching the *tendo achillis*, when totally divided ; but the most eminent and experienced surgeons now, disapprove that practice : and evidently with good reason, advising to have the ends of the divided tendon brought, and kept, as near together as possible, by a favourable position of the limb ; which is effected, by bending the knee and heel, and extending the foot, to such a degree as is easy to the patient ; keeping it so, after dressing the wound, according to the prescribed rules, by the following bandage, first equalising the small of the leg with soft, well adapted compresses of linen cloth,

At length a total division of the nerve was proposed, but not complied with ; soon after, an *emprosthotonos*, and other direful symptoms, supervened, and he died miserably, without resource.—The ancients used the word nerve in too great a latitude ; sometimes they meant tendon by it, but now its acceptation is fixed, and it is not used synonymously.

Many years ago a poor woman was my patient, on account of a slight puncture with her needle, between the nail and flesh of her fore-finger, which was attended with very violent symptoms ; and she lost the whole of the first joint, notwithstanding the utmost care to preserve it.

cloth, fine tow, or quilting cotton, the latter of which is preferable to the other. Begin the bandage, by making a few circular turns of a roller, of a sufficient length and breadth, about the thigh, just above the knee, passing it round below two or three times, describing a figure of 8 ; descending then in regular spiral revolutions, with small edgings, that it may lie even and easy, down to the ankle ; making there a few turns, as about the knee, proceeding spirally to the toes ; where, after making a few circulars, the roller is to be fastened with a needle and thread, reflecting it from thence upon the sole of the foot, up the back part of the leg, to the circulars above the knee ; securing it well there, and in the whole course of it, with a needle and thread ; taking particular care, all the while, to have the limb kept in its true favourable posture, by proper assistants ; and when this is done, it is necessary to have it rested upon a pillow in bed, strictly injoining the patient's own care, to keep the limb quiet. The application of this bandage may be begun upon the foot, at the toes, leaving a portion of the roller there,

to

to be reflected, secured, and fixed, as before described.*

Though I have succeeded by both methods, yet I must give the preference to the present practice, without stitching ; however, should stitching be thought by the surgeon, under any particular circumstance, more advisable, incision must be made, to come fairly at the end of the tendon, that is retracted with the muscle, when the division of it is at any considerable distance from the muscle, doing the same below, if found needful ; and then, with the fingers or *forceps*, first putting the limb into the position described, favouring the approximation of the ends, they are to be brought into contact, or as nearly so as possible, keeping them together by the interrupted suture, made with the needle appropriated to this use ; after which, the sticking plasters, applied as have been directed in uniting wounds, in order to aid the stitches, may prove, in some measure, useful, and the bandage, &c. as
just

* See in Vol. III. the conclusion of the case, in which the head of the *os femoris* was separated at the neck

just now described are to be used and attended to. By which soever method the cure is performed, great care and caution must be observed, when the wound is healed, that the extension may be made very gradually, in order to have the tendon acquire its former length, without running the hazard of destroying its union, before the intermediate substance is grown sufficiently firm. And in the cure of wounds of these parts, strict regard should be paid to the non-naturals.

There are two cases of ruptured tendons in the *Mem. de l'Acad. Roy. des Sciences*, in which, the skin was not broken; and the cures were performed by proper bandage, and position of the limbs. I have had one such, under my care, which succeeded as happily, by the same management.—Monsi. *Petit*, in his treatise *Des Maladies des Os*, mentions a soldier, who ruptured both at once, in jumping, without hurting the skin, and which he cured in the same manner.—See professor *Monro's* own case, in the *Essays and Obs. Physical and Literary*, vol. I, in which he describes a machine, of his own invention, to answer more effectually the end of our bandage.—I never saw the tendon, commonly called the *ligament*, belonging to the *patella*, ruptured, before the last

year ; and then, in a short space of time, two such cases came under my observation : the first was in a young woman, who about eleven months before, going out of one room into another, struck her knee against the door-post, dislocated the *patella*, fell backward at the same instant, and ruptured the tendon. When I first saw her, the limb was much emaciated, great pain attended the joint, with an inability of extending the leg, and she appeared absolutely incurable. The other accident of this kind happened to a gentleman of our faculty, aged about forty, by a fall from his horse ; but by keeping his limb properly supported, &c. he recovered considerable use of it. Both these cases were seen by several surgeons, who had never observed the like before.

Notwithstanding my apprehensions in the young woman's case, I advised good friction with a flesh-brush, and a warm embrocation to be well rubbed into the whole limb twice a day, having the limb supported with a light, well adapted, steel machine ; which had so good effect, that in length of time she recovered so much use, as to walk about her business, without pain, assisted by an under-hand cane, beyond expectation.

O F

POISONED WOUNDS, VENOMOUS BITES, &c.

WE are not to apprehend meeting with poisoned wounds, except among Indians and barbarians, whose practice has been to poison their weapons of war. It may be a difficult matter to distinguish, by their appearances, poisoned from other wounds, which may have a very ill aspect, and be attended with the most violent symptoms, as we have seen; arising from various other causes, without any suspicion of poison; but when there is ground for such surmise, as soon as we are called, we should enlarge the wound, if it is small, use the strongest suppurative applications and warm *cataplasms*; keeping the wound open, as long as we can; dressing, at least, twice in a day, and giving such *alexipharmics*, as the nature of the poison requires, which demands particular inquiry and attention, to discover whether it is of the vegetable, or mineral kind.——I have been told, the Indians dip their arrows into the juices of

putrid human bodies, looking upon them, so prepared, as the most destructive; and, I think, lord *Verulam* has something to this purpose in his writings.—*Theophrastus* says, the *Æthiopians* dipped their arrows into the juice of poisonous plants; and *Matthioli* tells us, that arrows or balls, impregnated with the juice of white *bellebore*, cause speedy death.—Some *Europeans* have been suspected of such diabolical practice, with *arsenic*, *merc. sublim. corros.* &c. but it is to be hoped, in these days, there is no foundation for it, in any christian country, or where they are not devoid of all sentiments of humanity.

In the bite of a mad animal, or venomous creature, it would be no irrational practice, though too severe for some, to have a piece of flesh instantly cut out, including the bite; or to have the *actual cautery* applied, in order to prevent the entrance of the poison into the blood; treating the wound afterwards, as has been directed, and having recourse to *alexipharmics*. In the bite of a mad dog or other animal, the *pulv. antilyssus*, *cinnabar* & *muske*, mercurial medicines, &c. have their advocates.

vocates. We may read *Mead, Layard, James, Nugent, Default*, and *Choisel*, upon this subject. I believe I have used, more than a hundred times, the *decoct. ad mors. canis rab. batean.* prepared with the addition of *sage* and *ash-coloured liverwort*, without a single miscarriage, when the patient took it regularly, before the appearance of the *hydrophoby* or other symptoms of madness; but after having read *Default's* book, about twenty years ago, I generally used mercurial ointment as he directs, at the same time, endeavouring to avoid a *ptyalism*.—It appears by the *Mem. de l'Acad. Roy. des Sciences*, that *Monf. Taurvy* was acquainted with mercurial unction on this occasion, about the conclusion of the last century.

The bite of a viper is effectually cured, as has been fully proved, by rubbing warm *olive oil* long and plentifully upon the part: and viper oil or fat, which should be fresh, is a sovereign remedy against the stinging of bees, wasps, hornets, and other venomous insects.*

O 3

OF

* Concerning poisoned wounds, &c. *Celsus, Paré, Schenkius, Heister, &c.* may be consulted.——*Caelius Aurelianus*

OF THE ACCIDENTS BELONGING TO
WOUNDS.

AN *hæmorrhage*, more or less, is a concomitant, or inseparable accident, accompanying wounds; but what has already been said upon this head, in the treatment of wounds of the blood-vessels, and previous to that, what relates to the use and efficacy of *styptics*, &c. made it unnecessary to say any thing more here to this purpose.*

2. Were

Aurelianus has written more fully upon the *hydrophoby*, proceeding from canine madness, than any of the ancients.—Those who are desirous to satisfy their curiosity farther concerning this kind of poison, may consult *Hildanus*, *Amatus Lusitanus*, *Zacutus Lusitanus*, *Baccius*, *Albertus Magnus*, *Horstius*, *Alfaravius*, *Palmarius*, with other observers, and *Comment. Van Swieten in Aphorismos Boerhaavii*.

* In lord *Clarendon's* History of the Rebellion, book 6, mention is made of some persons, who it was supposed by the surgeons, had the bleeding of their wounds restrained and prevented from proving mortal, by being stripped and exposed to the cold air all night, in the field of battle after Edge-Hill fight.

2. Were we to discourse on the article of *contusion*, enumerating its various effects and consequences in the different parts of the body, both internally and externally, we should exceed our design, which is to consider it only as an object in the cure of wounds, coming immediately under inspection ; but the effect of a blow, by an obtuse instrument, occasioning a wound, may extend even to the *fasciculi* of muscular *fibres*, connected by cellular membrane, breaking the *capillary* vessels, innumerably interspersed in the muscular *compages* ; and this consideration demands particular attention in contused wounds, when the patient's complaint exceeds what we see cause for, and gives us reason to suspect latent mischief. As the contused and lacerated vessels, apparent in the wound itself, are impediments to the reunion or healing of it, it is our business to assist nature in the separation of them, by moderately warm fomentations, digestives, and *cataplasms* ; scarifying some, and cutting off other parts, that have lost their vitality. Bleeding, gentle purging, and an exact regimen, are to be observed ; and the patient

cannot take too freely of resolving and attenuating liquors, in order to keep the blood in a proper state of fluidity, to prevent, or remove, obstructions in the wound and adjacent parts. If great tension and inflammation supervene, emollient fomentations and *cataplasms* are advisable. A decoction of *flor. cham.* & *sambuc.* in new milk and water, makes a good fomentation ; and bread, formed into a proper consistence with it, and a little fine *ol. olivar.* is a suitable *cataplasma* upon this occasion ; before the application of which, a plaster of *cerat. alb.* should be applied over the dressing of the digestive to the wound, which may be softened with the *samaritan balsam*, before recommended, and used warm, not hot : but should there be a tendency to a spreading *gangrene*, as sometimes happens in wounds violently contused, especially in constitutions where there is a depravation of the fluids, and laxity of the solids, then the *fos. commun.* made *antiseptic* with the addition of *sal. ammon. crud.* or *spirit. mindereri*, and a *cataplasma*, composed of this fomenting liquor, bread, *farin. bord.* and *spec. pro cataplasmat. c. cymino*, with the
addition

addition of *ung. simp.* or *ung. e florib. samb.* to keep it properly soft, are better accommodated to the purpose, with the use of the *bark* and *camphire*, if the patient is very languid. All these matters must be regulated by the surgeon's constant attention : no invariable rules can be prescribed.

An inflammation, attending a wound, may prove of very ill consequence, especially when it is accompanied with contusion and laceration of the parts ; and may terminate in a *gangrene*, if not timely prevented.—Gentle dressings, applied to the wound itself, and emollient fomentations and *cataplasms* are proper ; venesection, lenient purgatives, and cool liquid diet, must be used plentifully, paying due regard to the non-naturals. If the inflammation proves of the *erysipelatous* kind, which frequently happens in wounds, the same general rules are to be observed.*

The

* An ointment, prepared according to art, with the purest white part of *elder flowers* boiled in fresh *axungia porcina*, in a tinned pan, with the gentlest degree of fire, stirring it all the while very carefully, to preserve its whiteness and fragrance, free from *empyreuma*, is a neat
and

The immediate sensation of pain, upon receiving a wound, is from the division of the nervous fibrils, then from their divulsion; whence it may extend to some distance from the wound itself, which generally is not of long duration, nor much to be dreaded; but afterwards, pain in wounds, from various causes, may arise to such a degree, as to effect the whole body; disturbing all the operations of the animal œconomy, and nervous system,

and efficacious application in inflammations: and with the addition of *cera alba* makes a *cerate*, inferior to none, for such purposes,——In *erysipelatous* cases, *camphire* may be added to the ointment, first reduced into fine powder, and then well rubbed and incorporated with *ol. olivar. optim.* giving it the consistence of a liniment, to be applied with a feather, and a plaster of the *cerate* over it. These applications I have long used, much to my satisfaction.——In order to prevent an *empyreuma*, and the ointment from being robbed of its fragrance, and pure whiteness, it may be made in *balneo mariæ*. I have had it lately prepared for me in that manner, by pouring the *axungia* boiling hot upon the flowers, in a well glazed earthen pot, keeping it close covered eight or ten hours, in a kettle of boiling water.

See *Goulard's* Treatise upon the Virtues of Lead, which he too highly extols; on which account read *Aikin's* judicious Remarks upon it.

system, becoming by its excess and continuance, of the most dangerous consequence. It is the most violent stimulus, it breaks the patient's rest, brings on fever, inflammation, convulsions, &c. therefore all endeavours should be used to remedy this grievance, as speedily as possible ; and, in order to effect this important purpose, we have to consider the different causes of pain, that we may avoid falling into mistakes in practice. It may be owing to some extraneous body, vellicating the sensible parts ;—to the application of acrimonious medicines ;—to the half, or partial, division of a nerve or tendon ;—to inflammation and tension, distracting the nervous *fibrillæ* ;—to too strait bandage, or an ill position of the affected part. The nature of the causes plainly indicates the means of removing this dreadful evil ; as the extraction of the extraneous body ;—the application of emollient and anodyne medicines, such as a white-bread poultice, &c.—the total division of the nerve or tendon, if all other attempts fail ;—to take off the inflammation and tension, by the methods already prescribed ;—to alter the bandage,

dage, making it only retentive ; and to change the position of the limb or part : but when our design of removing this threatening symptom, by these measures, is not soon answered, it is necessary to have recourse to opiates to assuage it, given in proportion to its violence, till the cause can be effectually removed.*

Convulsions are the last symptoms we have to encounter, and are to be looked upon as the most formidable attending wounds. They are involuntary contractions of the muscles, proceeding from various causes, affecting the nervous system, particularly from irritations of the nervous or tendinous parts. They may arise from inanition, when profuse *hæmorrhages* debilitate the circulation, consequently the nervous influence, and every animal function suffer ; and the same inordinate muscular

* From what has been said upon this article, we may observe, how necessary it may sometimes be found, when we are obliged to make painful applications, to use lenients and anodynes, to mitigate the pain, as much as we can, and prevent inflammation.—See *Dissertations upon Pain and Anodynes*, by Mess. *Louis, Guyot, and Fabre*, in the *Prize Mem. of the Roy. Acad. of Surgery* for the year 1745.

muscular motions may be produced by repletion. The methods of cure are indicated by a proper attention to the causes whence they proceed; as, by removing the offending body, when they proceed from irritation; by giving nutrimental broths liberally, when from inanition, and by evacuations, especially venesection, when they arise from plenitude of the vessels; living upon very low diet. *Hippocrates* says, “*Morbis a plenitudine ortis*” “*mederetur evacuatio, illis vero qui inanitione*” “*fierent mederetur repletio.*” There is a remarkable case to this purpose in *Lower de Corde*, pag. 75, *Edit. Septim.*

Celsus and others speak of four kinds of *spasms* or convulsions, that may happen in wounds. 1. The *emprosthotonos*, which draws the neck and other parts of the body forwards. 2. *Opisthotonos*, a motion directly opposite to that. 3. *Tetanus*, which is that species of *spasm*, wherein we observe both anterior and posterior parts of the body affected, becoming rigid and inflexible. 4. The *spasmus cynicus*, sometimes called *risus sardonius*, is that kind, in which the mouth is drawn awry.

The

The locked-jaw is to be considered as a species of convulsion, and used to be looked upon as a mortal symptom in wounds, without resource, till *opium*, that heavenly remedy, was found to be a cure for it ; of which we have several instances, in the *London Medical Observations and Inquiries*.—It appears, from what *Hippocrates* has recorded in the seventh book of his *Epidemics*, that this kind of convulsive disorder had not passed unobserved by him, but he deemed it a mortal symptom. He mentions the case of a master of a ship, where, in consequence of a wound upon his finger, an *opisthotonos* attended a locked-jaw, which proved fatal.*

OF

* See doctor *Chalmers's* account of the *opisthotonos* & *tetanus*, in the 1st vol. of the *London Medical Observations and Inquiries*. He is a physician of eminence at *Charleston*, in *South-Carolina*, in which climate these convulsive disorders are much more frequent than in *Europe*.

Pachequus, a very eminent physician at *Montpelier*, in some remarks communicated to *Riverius*, which he made at the siege of that city, says, “ that many of the soldiers
“ wounded in the hands, were seized with convulsions of
“ the temporal muscles, and died soon after : and that
“ some of them could not open their mouths ;” which description

OF THE EXTRACTION OF EXTRANEOUS
BODIES.

THE extraction of extraneous bodies, is a part of surgery that demands particular consideration and attention. Under the denomination of extraneous bodies, are comprised those that will not unite with our solids, but hinder the reunion of the parts, wherein they are lodged, whether they be of metal, wood, stone, cloth, &c. and loose fragments of bones, dead contused flesh, coagula of blood, are to be considered as extraneous bodies; poison also may be included, but we shall principally attend to such, as may be taken hold of and extracted by hand or instrument.

The ancients had opportunities of seeing a greater variety of extraneous bodies in wounds, than we have, because of the various destructive instruments of war they used; whereas

scription exactly corresponds with the species of convulsion now denominated the locked-jaw, for which no remedy was then known.—Vid. *Prax. Med. Riverii*.

whereas what we use are chiefly cutting weapons and shot. The instruments employed in extracting these bodies, we may see delineated in *Scultetus's Armamentar. Chirurg.* taken from authors who have treated on this subject, as well as those of his own invention; but the modern military surgeons have, with good reason, much reduced the number.

After having discovered the extraneous body, the place for extraction of it, is that by which it entered; unless there is apparent danger of wounding some large blood-vessel, or other part of consequence, or it be lodged near the opposite side of a limb, or other part of the body; or being of such a shape, that it cannot be returned the same way it entered, without great laceration of the parts; as a bearded arrow, for instance, which requires to be taken out the opposite way to that it entered, or the wound to be sufficiently enlarged, to prevent laceration.*

In

* See *Gilpin's Life of Zisca*, that famous *Bohemian* general and reformer, who had his eye torn out of its orbit, in the extraction of a barbed arrow.

In order to extract the extraneous body, in the first manner proposed, we are to place the patient, as nearly as possible, in the posture he received it, for it is plain, thus, the passage will be more direct. *Gesner* mentions a very pertinent instance, of a surgeon, who, after many fruitless attempts to extract an arrow, asked the patient in what position he received it, and after understanding it was on horseback, he placed him in a riding posture, and immediately drew out the weapon without difficulty.

When the orifice of the wound is so small, that we cannot commodiously introduce instruments, to extract the extraneous body, we are to enlarge it, if practicable, without injuring any large vessel, nerve, or tendon; and after having gained good, clear hold of it with the *forceps*, we must proceed cautiously, first moving them from side to side, upwards and downwards, before we begin to draw, in order to loosen it, and dilate the parts; then extract it gently and gradually, to avoid lacerating them, applying the left hand to the place, whence the substance is to be extracted, in order to keep the member or

part firm ; and, under some circumstances, the operator may feel the course of the instrument, and be better directed, by this means, what turns to make, to facilitate the extraction.

When the case is so circumstanced, that we are obliged to attempt extraction of the foreign body, on the opposite side to its entrance, we are first to consider what parts we have to cut through, before we come at it, and when we know there are none in the way, that it is dangerous to wound, we may cut directly and boldly upon it, making the aperture in proportion to the size of the body, when we can judge of that ; however, too large, rather than too small, to avoid putting the patient to unnecessary pain, and confusing and lacerating the parts in the extraction of it ; proceeding then to finish the operation as directed.

The most seasonable time for performance of this operation, is generally immediately after the wound is inflicted, before inflammation and tension come on, which, adding to the sensibility of the parts, must consequently occasion more pain in the doing of it ; be-

sides,

sides, whilst the extraneous body remains in the part, it may excite violent symptoms by irritation, as we may see in the case related by Mr. *Wiseman*, of a nobleman's servant, who was shot by a highwayman : and *Bidloo* in his *Exercitat. Anatomic. Chirurgic.* gives an account of a soldier in the *English* army, that lost his life through the obstinacy of a surgeon, who refused to cut upon and extract a ball, which lay very favourably for the operation, between the fourth and fifth rib.—— A few years ago, the following case came under my inspection.

A young man, as he was earnest at his work, requiring the use of his knee, was sensible of something piercing the top of his thigh, three or four inches from the joint, but could not discover what it was. An able surgeon attempted, soon after the accident, to find what he apprehended might be lodged therein, and directed by the appearance of a puncture not bigger than a pin-hole, and by the patient's complaining of an extreme pungent pain upon pressure, he made incision in search of it, but in vain. Many weeks after, I was called into consultation,

the symptoms becoming very threatening ; a considerable fever was raised, violent pain attended the thigh, and he was not able to set a step, without having the whole limb thrown into spasms ; but the swelling and inflammation were inconsiderable. We examined the limb with the utmost care, and upon pressure, several inches from where the puncture was, under the *fascia femoris*, he complained of a very acute pricking pain, which instantly brought on the spasms. These considerations determined us, without hesitation, to make incision upon that spot, through the *fascia*, where we fortunately discovered and extracted a needle, about two inches long ; upon which the symptoms vanished, and he was soon cured.

Notwithstanding the obvious disadvantages of suffering extraneous bodies to remain in wounds, yet if tension and inflammation have already seized the parts, the orifice of the wound being also closed, the substance lying deep, and the patient weak and languid, the pain which the operation, under these circumstances, must necessarily occasion, probably would greatly increase the inflammation,
raise

raise the fever to a high degree, and perhaps throw the patient into convulsions ; therefore it is advisable to postpone it to a favourable opportunity, applying emollients and anodynes, and paying due attention to the patient's state and condition in all respects.

Should a large extraneous body happen to be lodged deep, and firmly fixed, so that it cannot be brought away, without great laceration of the parts, nor incision safely made, to facilitate the extraction, it is prudent not to venture to attempt it, but to wait, till it loosens by suppuration ; which should be promoted by emollient *cataplasms*, and such applications ; then, there is reason to expect, it may be extracted with more ease and safety. There is a memorable case to this purpose in the *Journal des Sçavans*, for the year 1735.—Cases of this nature call upon the surgeon for deliberate consideration and attention.

Upon a supposition that a foreign body is lodged in a part, though it cannot be discovered, we should not torment the patient, by cutting at random to find it, because we

may do much more harm by the searck, than its continuance in the part would occasion ; for we have instances of various kinds of substances being lodged in different parts of the body a long time, without doing any remarkable injury.—*Hippocrates* relates the case of a person, who was wounded in the groin with an arrow, the head of which remained in the part, yet he found no inconvenience from it, till six years after, when it was discovered, incision made upon it and extracted.—*Deckers* tells us of a gentleman, who was wounded in the right *hypochondrium*, and, thirty years after, had the ball extracted at his knee.—*Alexander Benedictus* says, that a *Greek* was wounded on the right temple with a dart, at the siege of *Colchis*, and taken captive by the *Turks* ; after the wound was healed, he lived twenty years in slavery, then obtained his liberty, and came to *Sidon* ; five years after that, as he was washing his face, he was seized with a fit of sneezing, and discharged, at one of his nostrils, a piece of the dart, with the iron point of a considerable length.—*Hildanus* gives an instance of a piece of a sword, that

was

was lodged in a gentleman's face several years, before it was extracted from an *abscess* then formed : and he relates a case, in which a ball remained six months between the skull and *dura mater*, without producing any bad symptom.—*Amatus Lusitanus* speaks of a drunken courtesan, who, in a fray, was wounded with a long sharp-pointed knife ; in which case, the wound healed, and she found no defect in her animal or rational faculties ; but eight years after, dying of a fever, and her head being opened, a large piece of the knife was found between the skull and *dura mater*.—*Monf. Le Dran* in his treatise on gun shot wounds, speaks of his own knowledge concerning the lodgment of a ball near the *sella turcica*, the patient dying suddenly a year after the accident.—An eminent surgeon of my acquaintance told me of a case, in which a ball was extracted, and some months after, a piece of cloth was expelled, till which time the wound kept open, but was then soon healed.—In *Chelsea* hospital, an old foldier had a piece of rag discharged from a wound, that it had kept open many years, which then healed

without any trouble.—Hence we see, nature often exerts herself, to get rid of an extraneous body, by suppuration, or raising an *abscess* in the part where it is lodged, and by that means expels, or brings it near the surface, so as to be easily extracted.—On this occasion I may also relate, from a gentleman that knew it, the case of a boy in the *Hôtel Dieu* at *Paris*, who, three weeks after swallowing a long needle, in a piece of bread, had an *abscess* formed a little below the navel, on the right side, and the needle extracted from it.—*Ruyfch*, *Purmannus*, and *Hoffman*, take notice of such cases.—*Wiseman* inveighs against too much endeavouring to extract extraneous bodies, giving instances of nature's efforts to relieve herself, yet when they can, with convenience and safety, be removed, they should not be left.*

It

* *Formius*, a surgeon of great note and experience, who has been mentioned, communicated to *Riverius* a very singular case indeed, wherein a small leaden ball was fixed and remained seven years in the body of the *os calcis*; in consequence of which, the wound degenerated into an ill conditioned ulcer, attended with great caries of the bone. After denudating the bone, by two applications of

It is no irrational supposition, that a weapon should pierce the *aorta* or *carotid*, and stop the aperture so close, that little or no blood could immediately escape, the patient surviving the infliction of the wound a short space of time, though death would instantly follow the extraction of it ; and probably this might be the case of *Epaninondas*, as recorded by *Cornelius Nepos*, who; fighting against the *Lacedæmonians*, was sensible of having received a mortal wound, and apprehending he should die, as soon as the head of the lance was drawn out of his body, it was kept in, till he was told the *Bæotians* had conquered, upon which news, says he, “ I
“ have lived long enough, for I die uncon-
“ quered.” The deadly weapon was then extracted, and the renowned general expired

of a caustic, he found it necessary, in order to come at and extract this extraneous body, to make use of the trepan ; then it was easily extracted, and the ulcer soon cured. He also mentions a case, in which a piece of a sword remained many years in a person's arm, the wound being suffered to close without searching for it at first ; at length it appeared under the cicatrix, on the superior part of the arm, where it entered, and was then cut upon, and extracted covered with rust.

pired instantly.—*Petrus de Larenta* confirms the other part of the supposition, by a narrative he gives of a man, who, after being wounded in the neck, the arrow sticking in one of the *carotids*, spoke very well before the extraction of it, but died immediately after.*

OF

* Some eminent practitioners, of former ages, have looked upon the operation of extracting extraneous bodies rather unnecessary, making great account of their secret applications, which they termed *attrahents*, but are to be looked upon only as *suppurants*; and what confirms this opinion is, that many of the medicines, for this purpose, mentioned in *Forestus*, *Mangetus*, &c, are no more than common digestives.

OF THE NON-NATURALS, WHICH ARE OF GREAT
CONSEQUENCE TO BE OBSERVED IN CURING
WOUNDS, WHETHER ACCIDENTAL, OR AFTER
CAPITAL OPERATIONS.

(1) THE atmosphere the patient breathes in, should be dry, with a temperate degree of heat, free from all noxious vapours. Moist and cold air obstructs perspiration, whence proceed various disorders; and intense cold contracts the vessels, and coagulates or thickens the fluids; and when excessively hot, it produces putrefaction, and large suppurations with acrimony. The inconveniencies arising from excessive cold, are to be remedied by fires, and for those proceeding from immoderate heat, the patient's room is to be cooled, by opening a window, admitting the breezes and fresh air, placing large pots of water in different parts of it, with fragrant aromatic herbs and flowers in them, strewing some upon the floor, which will diffuse refreshing and vivifying *effluvia*, to correct the ill effects of putrid exhalations, affecting

affecting the lungs, and animal œconomy. It often happens in hospitals and ships, where great numbers of patients are crowded together, that such a corrupt and stagnant air causes various disorders, and the worst kind of fevers ; therefore those who have the care of the wounded, cannot be too solicitous to have them breathe a pure, fresh, untainted air, impregnated, if possible, with a grateful fragrance, to refresh the spirits ; seeing that the sick-room be kept neat and clean : and in order to correct putrefaction, vinegar may be sprinkled upon the floor, and upon the bandages, mixed with lavender-water, or some such pleasant scented liquor ; vinegar is the best antiputrescent we have.*

OF

* See what sir *John Pringle* and doctor *Donald Monro* say concerning this important matter, in their account of diseases of the army ; particularly the former gentleman's observations on the jail and hospital fever.

OF DIET.

(2) DIET, in the cure of wounds, as well as diseases, is often of the utmost consequence to be attended strictly to. *Hippocrates*, *Celsus*, and the best writers since their days, enjoin a spare diet in wounds, in order to prevent inflammation, fever, &c. saying, it should be food that affords good juices ; by which must be meant, such as will soon digest, and be easily assimilated ; not of a glutinous nature, that would make our fluids viscid, or apt to become putrid and acrid, tending to produce obstructions, inflammation, &c. It should principally consist of the vegetable, farinaceous kind, and what animal food is allowed, should be confined to weak broths, except under particular circumstances, that will be specified. Barley-broth, oatmeal-gruel, ptisan, almond-emulsion, thin chicken or veal broth, &c. should be taken freely. The patient may eat boiled or roasted apples, boiled pot-herbs, such as spinach, lettuce, &c. avoiding every thing of a poignant, stimulating

lating quality, for the reasons we have given; as flesh-meat high-seasoned; all fermented liquors, as wine, beer, &c. or ardent spirits; all strong soups or broths, and alcalescent plants, as celery, cresses, horse-radish, mustard, &c. in order to have a soft, balsamic chyle, that the blood may be free from acrimony, or tendency to an inflammatory state, productive of fevers, &c. However, in some cases, we must take care, we do not adhere too closely to these dietetic rules, in the cure of wounds. We must always have a regard to the strength, weakness, and constitution of the patient; for if it is a weak, faint person, there is a necessity of giving good nutritive broths, and temperate cordials, allowing wine, diluted with water, or even wine alone, as the best of cordials to some people. The patient's usual manner of living must also be considered, remembering the old saying; Custom is a second nature: and certainly it is so; for when a person has been inured to a particular way of living, a sudden and great alteration in it may prove very detrimental, which is evinced by daily observation.

When

When the *Dutch* acted in confederacy with us, the *English* army fed chiefly upon flesh, and the *Dutch* upon vegetables ; and in the different hospitals, the wounded men were treated accordingly ; but whenever the *Dutch* were carried off to the *English* quarters, and *vice versa*, many of both parties suffered greatly ; the *English* grew faint and languid with a vegetable diet, and on the contrary, the animal food threw the *Dutch* into fevers.

Our own countryman, the great *Wiseman*, shows the necessary latitude to be allowed on these occasions, by several instances, particularly in a person, accustomed to drink wine too freely, that was bitten on the back of his hand by a monkey ; and so long as he was obliged to abstain from that liquor, he grew daily worse and worse, but when he was allowed it, he immediately grew better, and soon recovered.—*Bonetus* gives us the history of a young gentleman's case at *Paris*, who being confined to broths, ptisan, &c. and absolutely forbidden the use of wine, to which he was addicted, died of a wound in his thigh, though it was no more than a simple

ple one of the fleshy parts, as appeared upon examination after death, which was ascribed to too much abstinence.—Professor *Monro* speaks of a cook at *Edinburgh*, who had the cartilaginous part of his nose cut off, and lost so much blood, before he saw him, that he was scarce able to support himself; after stopping the *hæmorrhage*, and dressing the wound, he ordered him broths, allowing him a moderate quantity of wine; however, according to his customary way of living, they were not sufficient for him; he continued faintish for some days, complaining of great pain in the wound, and was seized with a *diarrhæa*; his wife then secretly gave him drams, to which he had long accustomed himself, and they had so good an effect, that his symptoms immediately abated, and he was cured in a short time.

The season of the year is likewise to be considered in respect to diet, in the cure of wounds; those kinds of things of a poignant nature, which we have cautioned against the use of, have worse effects in summer than in winter; when indeed, some of them may prove beneficial in stimulating the circulation,

tion, which might become too torpid, for want of such assistance.

The last thing we have to consider, in relation to diet, is the disease the patient may labour under, when he receives the wound, or the symptoms that may attend it. If he is weak, or hydropic, strengthening food, wine, &c. must be allowed; but if he is strong, plethoric, and feverish, a spare diet is strictly to be observed in general. Hence we may see, that according to different circumstances and symptoms, different regimens must be prescribed: and the same may be said of medicines, which require as much variation. In order therefore to prescribe properly, upon such a variety of occasions, the surgeon, as we have hinted, must have a competent knowledge of the animal œconomy, of diseases, and of the *materia medica*.*.

VOL. I

Q

SLEEP

* Read *Arbuthnot* upon the Nature of Aliments; to which treatise are added practical rules of diet in the various constitutions and diseases of the human body.

SLEEP AND WATCHING.

(3) THERE is nothing refreshes a person like sleep. The want of it causes the greatest fatigue and anxiety, and is frequently the occasion of many disorders. Pain is the great disturber of rest; therefore all possible endeavours should be used, to remove or alleviate it, as directed under that article; considering the respective causes, whence it arises. The narcotic or anodyne remedies, which we have recourse to, on these occasions, to destroy the sensation of pain, till we can remove the cause, are poppies, and opium, the inspissated juice of those growing in the *Levant*, of which we have a great variety of officinal preparations. Perhaps the strength of the poppies of our own growth, is not so much inferior to them, as is generally imagined; for, by making incisions in some fine large heads, growing in my own garden, I extracted the milky juice into proper receivers, where I suffered it to
inspissate

inspissate with the heat of the sun ; and, by experience, found it nearly as strong as the *Theban* or *Turkey* opium.*.

MOTION AND REST.

(4) ALL imaginable repose should be recommended to the patient suffering under a dangerous wound ; but motion is less prejudicial to those wounded in the superior, than in the inferior, limbs. The reason that rest and quiet should be so strictly enjoined, on this occasion, is too obvious to want explanation ; since the agitation of the body is well known to accelerate the circulation of the blood, and consequently tends to produce inflammation. The patient should not only keep himself as still and composed as possible, but have the room kept free from noise, and rather dark, in very dangerous wounds in any part, but more especially in those upon

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the

* See *Jones* on the mysteries of *Opium* revealed : and the late professor *Alston's* dissertation upon *Opium*, in vol. v. of the *Med. Essays*. Also *Young* on *Opium*.

the head. *Hildanus* mentions a melancholy story of a boy to this purpose, who was brought to his grave by music and dancing in his room, which immediately occasioned dreadful symptoms, though he was before in a very hopeful way of recovery.

RETENTION AND EXCRETION.

(5) IT is an invariable rule, not to prescribe strong purges for wounded persons; the stimuli of which will be apt to raise or increase feverish symptoms, and dissolve the fluids too much: but, at the same time, we must be attentive to avoid costiveness; for, by retention of the *fæces*, they become more and more acrid and putrid, communicating, in some measure, their pernicious quality to the mass of blood. We are, therefore, to keep the body soluble with laxatives, by the mouth, or in the form of clysters. *Manna*, *cassia*, &c. called *eccoprotics*, having a stimulating property in a low degree, are the proper medicines to answer this purpose.

PASSIONS OF THE MIND.

(6) ALL violent passions of the mind disturb the functions of the body ; as grief, fear, anger, &c. for which reason, they should be studiously avoided or subdued, that they may not gain an ascendant or dominion. The patient should be kept free from care, and in all possible good humour and tranquillity ; for the body always sympathizes with the mind ; and we have incontestible examples, proving the pernicious effects and consequences of inordinate passions upon the wounded. *Hildanus* relates several instances, showing their influence ; particularly of two persons, who were wounded in the hand, and, by excessive laughter, had most violent pain excited in the wounds, extending through the arm quite to the neck, attended with convulsions, which brought them into imminent danger. This great man attempts to account for the effects of risibility in these cases, supported by the authority of *Laurentius Joubertus*.—He also gives a narra-

tive of a youth, who had a wound of his head, accompanied with a fracture of the skull, in whose case all things appeared fair, and promising; but being provoked to anger, he grew immediately feverish, soon after delirious, and died in four days.—The same author informs us of a man, whose *temporal* artery was divided, and the *hæmorrhage* restrained for five days, by a *slyptic*; but upon being then put into a passion, the artery burst open, and the effusion of blood was stopped with great difficulty.

All acts of *venery* are to be avoided; for they much accelerate the motion of the blood at the time, leaving all the powers of nature in a state of debility, and disorder the nervous system.—*Hildanus* proves the ill effects of venereal pleasures, in the case of a young man, that was wounded on the head; who, six weeks after the accident, when the wound was nearly cicatrized, had a fever raised by such an adventure, and died in a short time. He farther confirms the bad consequences, arising from this source, by an account of a person whose arm was amputated, and the stump almost healed; and
who,

who, from no other evident cause, but such an act of indiscretion, was seized with a fever, attended with delirium, which soon ended in convulsions, and death.—*Boerhaave* relates a case that proved fatal from the like cause.—A practitioner of great note has expressed himself thus, concerning a patient. “It was by the merciful providence of God, that he recovered, having daily commerce with a courtesan.”—*Paré* says he has observed many instances of the dire effects of *venery* in wounds.*

Having given a general description of wounds, their *diagnosis* and *prognosis*, treatment, &c. as at first proposed, we now proceed to the second part, beginning with wounds of the head; but at the conclusion of this, it may not be amiss to say a word or two concerning *venesection*, which I had almost forgotten; that an evacuation of such consequence in the cure of wounds, as well

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as

* In respect to the non-naturals, we may consult *Wainwright*, *Burton*, *Sanctorius's Med. Static.*, *Keil's Med. Stat. Britan.*, *De Gorter*, &c.

as in diseases, may not be improperly or indiscriminately prescribed. In old, weak, or infirm persons, or when a great quantity of blood has escaped by the wound, it might prove very detrimental ; and in small wounds, unattended with symptoms of pain, inflammation, &c. it is needless ; but in wounds, accompanied with such accidents, in a patient strong, young, and plethoric, with a full, tense pulse, it then becomes absolutely necessary to take away blood, as plentifully as his strength will bear ; especially in injuries of the head, as we shall show, which practice is supported by the best, and most experienced writers.—Indeed, the *French* use the lancet more freely than we do ; and I am apt to think, from what I have observed in their writings, and heard of their practice, from eye witnesses the most rational and intelligent, they sometimes carry it to a dangerous excess, by weakening the vital powers, and relaxing the solids so much, as to bring on hydropic symptoms, hard to remove.—By endeavouring to avoid one rock, they split upon another ; robbing the
blood

blood too much of its density or red globules, which, by some physicians, is very significantly called, *spoliation*.—Nothing in the practice of physic requires more skill and judgment, than prescribing in respect to this evacuation.

P A R T II.

OF WOUNDS, &c. OF THE HEAD.

IN this chapter we shall treat not only of wounds, but of the various kinds of injuries, incident to the head, and the *encephalon*; beginning with incised wounds of the scalp, muscles, and *pericranium*.

In order to judge, whether only the external parts of the head are injured, we are to consider the size and shape of the weapon; whether it has a strait, or a rising edge, by which the wound was inflicted; the degree of force used; and the length and figure of the wound. When it is long, made by a strait, cutting instrument, we have reason, from the spherical form of the skull, to fear
more

more may be hurt than the teguments ; but if the wound is short, to hope it extends no farther, unless made with a sharp-pointed weapon, pushed with great force ; then indeed, though the external aperture is but small, it may even penetrate into the cavity of the skull, and injure the *encephalon*, which are the parts therein contained ; therefore it is necessary to examine the weapon, carefully inspect and explore the wound, and consider the symptoms, in order to form our judgment.

It was a general rule, first laid down by *Hippocrates*, the great luminary of medical science, never to be hasty in delivering a *prognostic* in wounds of the head, or to make light of such injuries upon that part, though they may appear trivial ; for we have, upon record, many instances of such wounds, unattended with any threatening symptoms at first, that have proved mortal.—*Hildanus* tells us, that a young lady, when warm with dancing, struck her head against a post, making a slight wound, which she neglected two days, being sensible of no uneasiness ; it becoming then very painful, a barber-surgeon

was

was called to her, who made very light of it; but on the fourth day, she grew feverish, and complained of extreme pain; on the sixth, delirious symptoms came on, and she died soon after. In this case, no external injury of the skull could be discovered, but upon opening it, extravasated blood was found, and the membranes of the brain inflamed to a high degree.—*Timæus* speaks of a person, who made no complaint for nine days after receiving a wound upon his head; but, on the eleventh day, was seized with convulsions, and died on the twelfth.—*Doleus* relates the case of a *Hanoverian*, who was first seized with vomiting, then with a *delirium*, and soon after died convulsed, in consequence of a contusion apparently slight upon his head.—*Bohnus* has a very extraordinary case of this kind.—Not long ago, I saw a young man, who went about his business three weeks after receiving a blow just above his ear, which stunned him at first; but there was no external appearance of contusion. His first symptoms were giddiness and pain, convulsions ensued, and art could not save him. The *dura mater* was inflamed,
the

the vessels, running in the plicatures of the *pia mater*, turgid, and some ruptured, as we discovered upon opening the head.—In *Stalpart Vander Wiel* we find a great collection of observations to this purpose, from the best authors, wherein the patients suffered, some sooner and some later.

If a wound is made by a blow with an obtuse weapon, or by a fall against some hard body, it may prove much worse in its consequences, than when received by a cutting instrument; the external parts may suffer more, besides the danger of a concussion of the brain.—It is not at all to be wondered at, when we consider the nature of the parts, the connexion, dependance, and communication, between the external and internal, that the brain and its appendages should suffer; and that violent symptoms or effects should be produced by such causes, though they might not originally have had their power extended to the interiors of the head.

If the external orifice of the wound is small, and the wound large in the subjacent parts, it is more dangerous; because the matter confined there, becoming acrid and
irritating

irritating by intestine motion, may insinuate itself far about, producing deleterious symptoms, if not timely prevented by ample openings, as I have seen.—Such wounds are then to be treated according to general rules.

A simple incised wound of the teguments of the head, requires no other method of cure, than has been mentioned in respect to wounds in other parts; only we should be more cautious in the regimen, keeping the air from the wound, and not dressing it with applications of a moist, oleaginous nature; which doctrine is agreeable to the opinion of the ablest surgeons, ancient and modern. *Hippocrates* says. “ *Capitis vulnus nulla re* “ *maledficiendum*——.” In another place he says. “ *Malum est, humidum in vulnere ca-* “ *pitis carnem esse, et nimia uligine diffuen-* “ *tem,* ——.”——It has been observed, that wounds of the head are cured with difficulty in *Italy*; probably owing to the surgeons in that country using oleaginous and relaxing applications; for *Marcus Aurelius Severinus* blames the *Neapolitan* surgeons for using oil, in wounds of the head; commending the
Maltese,

Maltese, for mixing wine with it, to correct its relaxing quality ; but even with this correction, it is not a proper application for these wounds. *Unguent. e gum. elemi*, with the addition of a little of the purest kind of turpentine, or natural balsam, is a good application, and it may be better to apply it upon a pledget over dry, even lint.

If the temporal muscles, or those inserted into the occipital bone, or the tendinous or nervous parts, are contused as well as wounded, the worst of symptoms are greatly to be feared ; which should be prevented, if possible, by early attention, or remedied by the treatment, directed in contused and lacerated wounds in other parts ; though these are attended with a greater degree of danger, from their vicinity to the brain, &c. as we have just hinted.—In contused wounds, there may be extravasation of blood, or in consequence of inflammation, collections of purulent matter, that may form *sinuses*, which require opening directly, to allow a free exit to the blood or matter, and to give convenient room for the application of proper medicines, by which the ill effects, that might otherwise

otherwise follow, may be prevented, as may be seen in *Berengarius*, *Doleus*, *Muys*, *Scultetus*, *Wiseman*, &c.

When the *pericranium*, or the expansions of the *tendons*, suffer by wound or contusion, separately or conjunctly, the nervous system may be thrown into dreadful disorders ; under which alarming circumstances, we must not hesitate a moment in making an ample incision, quite to the bone, taking care that the wound in the *pericranium*, or tendinous expansion corresponds with that of the scalp in laying the bone bare, in order to free those sensible parts from that tension and inflammation whence the alarming symptoms arose.—*Monf. Pouteau*, surgeon-major of the *Hotel-Dieu* at *Lyons*, in his *Melanges de Chirurgie*, an excellent work, has two singular cases to this purpose.—The case of prince *Charles*, son of the king of *Spain*, was of the same nature ; and which the great *Vesalius* treated with so much judgment, as to gain him immortal honour at the court of *Madrid*.*

Injuries

* See the Life of *Vesalius*, prefixed to his works by the editors *Boerhaave* and *Albinus*.

Injuries of these kinds, upon the head, are frequently accompanied with inflammatory swellings to a great degree and extent, having sometimes the appearance of an *erysipelas* and *phlegmon* mixed together, and sometimes they are also *emphysematous*; on which account the general antiphlogistic method is to be observed.—*Garengeot*, in his treatise on the operations of surgery, undertakes to lay down, what he calls, a certain sign of knowing whether the *pericranium*, or only the other teguments are concerned in these kinds of tumours; but it is fallacious, and by no means to be depended upon, as a *criterion*. Indeed his manner of reasoning, upon this point, rather tends to perplex, than elucidate and support his argument.—An extraordinary tumour of this sort I have mentioned in my observations, attending a fissure on the *os frontis*.—And, many years ago, I was called to a man of an advanced age, the fourth day after his receiving a small contused wound on his right temple. We could not discover any injury done to the skull; his head and face were swelled in a prodigious manner, his eyes were closed, and the tumour

appeared complicated of the *erysipelas* and *phlegmon*. Notwithstanding our utmost endeavours the swelling increased ; he grew delirious, then comatose, and died convulsed on the seventh day.—I was lately consulted for a young man, on the fourth day after his having received a contused wound, by a fall, on the right side of his forehead. The surgeon, who was immediately called to him, lost no time in scalping, and treated the patient properly in all respects ; he could discover neither fracture nor fissure, but in two or three days, the whole head and neck were tumified, and emphysematous to an enormous degree ; the *emphysema* extending as far as the *abdomen*, and below the shoulder-blades, as if blown up with a pipe. When I first saw him, his senses were imperfect, soon after he became very delirious, and died in convulsions the next day.—Leave could not be obtained, in either of these cases, to examine the heads of the patients after death ; people in the country generally having an abhorrence of such useful inspection and inquiry.

When

When the *pericranium* is only cut through, and the bone bare, without contusion, or loss of substance of this membrane, or injury done to the bone, even though the scalp is considerably separated from it, we may bring the lips of the wound, as near together as we can ; keeping them in proximity, by the dry, rather than by the other future, with proper easy compress and bandage, as have already been described. *Berengarius, Wiseman, Belloste*, and other eminent practical writers, recommend this kind of treatment, which I have seen attended with success in many instances ; and in two, where large flaps, leaving the bone bare a great space, grew to it again, by being clapped down, before the air had made impression upon the parts, to prevent their reunion.

The *pericranium* being strongly attached to the skull, by an infinite number of vessels, when that membrane is taken away, by any external force, the bone must suffer in proportion to the violence of the cause producing that effect ; and then the access of the air may prove farther detrimental to it, against which it should be defended as much as pos-

fible. The first apparent change of colour of the bone, under these circumstances, is from a blueish white to a yellow, growing gradually darker, approaching to black. Nature will, sooner or later, according to the depth that the substance of the bone is injured, separate the dead parts from the living, by flesh sprouting from the subjacent vessels; and once I had a very fair opportunity of discovering, even without the assistance of a glass, the vibrations of the new made arteries, upon the appearance of this kind of vegetation, coming through small holes in the very thin scales of the skull, as they were casting off, by that means. This operation of nature is called the exfoliation of the bone. After that impediment to healing is removed, the vascular compages or flesh, proceeding from the extremities of the vessel belonging to the bone, forms a net-work, which, covering the bone, and uniting with the flesh generated by the neighbouring parts, supplies the loss of substance. This doctrine is agreeable to the universal consent of physiologists, and the most attentive surgeons.

Hence

Hence we see, that the denudation of the bone, under these circumstances, protracts the cure of the wound ; but in order to hasten it, and prevent ill accidents, from exposing the *cranium* to the cold air, *Belloste* proposes dressing but seldom, after making many adjacent holes, with a drill or *perforator*, as far as the *meditullium*, whence flesh, he says, will proceed and cover the bone, before the influence of the air can make exfoliation necessary to the cure ; but from experience, I have found this method will not always succeed ; the reasons are obvious enough, when we consider the vessels of the bone may have received so much injury, by the fall or blow, as to destroy their vitality in such a manner, that terebration cannot answer the proposed end ; and we may easily conceive, what must prove the consequence of covering the bone over with flesh in such a state.—Concerning this practice, we shall say something more, under the article of contusion of the skull.—Formerly, surgeons of the greatest note, and among the rest, *Wiseman*, used to rasp or scrape the parts of the bone thus altered, and also in fis-

fures.—I have twice succeeded, beyond my expectation, by scraping first, and then making many small holes in the *cranium*, till the blood was ready to start; and I have often greatly expedited the cure of some kinds of *caries* in the bones, in other parts, by the same management, having a variety of instruments, applicable to these purposes.*

We are to endeavour all we can to prevent any great flux of matter, avoid every thing that may corrupt the bone, as oleaginous applications, &c. Spirituous, warm, subtile medicines are to be used; we may recommend *tinct. myrrh. tinct. mastich. spirit. terebinth.* &c. which preserve the bone from corruption, and defend it against the influence of the air; the other parts of the wound may be dressed with dry lint, covered with a pledget of *unguent. e gum. clemi*, &c. care being taken to suppress a luxuriance of flesh, as mentioned in the treatment of wounds in general.—Keeping the parts
warm

* Vid. Comment. *Van Swiet.* in *Aphorism. Boerhavii*,
§ 254.

warm promotes the regeneration of flesh, and consequently the exfoliation of the bone. During the time of dressing, the ambient air may be warmed, if the season of the year requires it, with a chafing-dish of coals.—Whether terebration, &c. are practised or not, this method of dressing is proper, and should be performed as expeditiously as possible.—Fungous flesh is apt to grow from the lips of the wound, and lie loose upon the bone, without great care in the dressing to prevent it, and which neglected might create much trouble, both to the patient and surgeon, as I have seen more than once; and in one case that I was concerned in, about six months after the accident, the cure was obstructed, through inattention in this respect, not a little to the prejudice of the surgeon's character.

OF THE VARIOUS INJURIES INCIDENT TO
THE SKULL.

WE have now to consider the different injuries the cranium may suffer ; first giving a short account of its bones, &c. It is a kind of box or case of a *spheroidal* figure, containing and defending the brain, with its appendages, against external injuries, formed of eight bones ; which are the *frontal*, two *parietal*, two *temporal*, the *occipital*, the *sphenoid* and *ethmoid*, connected by the *coronal*, *sagittal*, *lambdoidal*, *squamous*, and *transverse* futures ; the *coronal* runs across the skull, from the upper edges of the *sphenoidal* bone, joining the *frontal* to the *parietal* bones : the *sagittal* begins at the *frontal* bone, ends at the *occipital*, and joins the *parietal* bones ; under which future lies the longitudinal *sinus* ; and this future is continued down to the nose in children, dividing the *os frontis* in the middle. The *lambdoidal* future connects the posterior parts of the *parietal* bones to the *occipital* bone, and under this future is
the

the course of the lateral *sinuses* ; and in this future are found more of the *ossa triquetra*, or *wormiana*, from *Wormius*, the discoverer of them, than in any other. The *squamous* futures are made by the superior parts of the *temporal* and *sphenoidal* bones, lapping over the lower parts of the *parietal*. The *transverse* future passes over the face, and runs through the bottoms of the orbits of the eyes, joining the lower edge of the *frontal*, to the *sphenoidal* bone. The bones of the skull have two tables, separated by a *medullium*, but this *diploë* is often wanting, as well as the futures obliterated, in old subjects ; there are also holes, convexities, projections, &c. to be remarked, by an examination of the skeleton, in order to prevent falling into mistakes.

The best authors, ancient and modern, divide the injuries, of which the skull is susceptible, into five kinds, as a *fissure*, a *fracture*, a *contusion*, a *depression*, and a *cut* ; but before we treat of these injuries, it is proper to direct the methods necessary to be taken, in order to discover the nature of them, when they do not evidently appear,
after

after being assured, that the patient has received a hurt by a blow or fall upon his head, though we cannot precisely determine the place, where the hurt is. The way to come at the knowledge of it is, as *Hippocrates* directs, *de capitis vulneribus*, by examining the nature of the weapon, with the manner that the patient received the stroke or fall, and the length of the wound is to be considered; for a very long wound cannot be inflicted upon the head, without manifest hazard of injuring the skull, as has been remarked, on account of its *spheroidal* figure; and we must also remember, the difference of thickness in the different parts of the skull, as well as their natural convexities and projections; but there is such a variation in skulls, that with the utmost attention, we may sometimes be deceived. In exploration with the probe, we must not forget the *sinuosities*, the *inequalities*, *sutures*, &c. lest the rough and unequal surface of the skull deceive and lead us into some such error as that mentioned of *Hippocrates*.—This great man, and other eminent authors since his time, advise giving the patient some hard substance to chew, as
a crust

a crust of bread ; or to put a string between his teeth, pulling it with a sudden jerk, which, they say, will give a sensation of pain in the injured part of the skull ; but these experiments are by no means to be depended on ; they can have no effect, except in those parts, where the *temporal* muscle is attached, as *Berengarius* well observes ; who also tells us, that some people, particularly *Lanfranc*, pretended to make the discovery, as is commonly done in earthen-ware, to find if it have a flaw, by striking the skull with some small solid body ; but this experiment is equally fallacious and ridiculous as the other. Feeling with our fingers will sometimes serve us, though not always ; when therefore we are called to a patient, whose skull we have reason to fear, from the symptoms, has suffered an injury, if there are no visible signs to direct us to any particular part, we are to examine strictly, with our fingers, in every part, the head being first well shaved, in order to discover any inequalities, or yielding of the bone, or puffy softness of the teguments, attended with some sense of pain upon pressure, which may guide us to the injured

injured part of the bone : and the patient, though he may not be perfect in his senses, still may give us some light into this obscure matter, by clapping his hand to the part, where he feels pain.

When we have discovered a suspicious part, with symptoms of a fracture or fissure, it should be opened to the bone directly, in order to prevent the worst of consequences, of which we have innumerable instances, proceeding from delay ; as we may find in *Schenkius*, and other observators, and some such I have observed.

We shall here cursorily take notice of the different manners of opening the parts, as the means of inquiry, necessary in all the injuries happening to the skull ; deferring the rest till we come to particular cases, because all of them have something peculiar to be attended to. Laying the bone bare, or scalping, is done by cutting the scalp with a strong knife, appropriated to this use, and called a scalping-knife, lately much improved. Writers upon this subject have directed the incision to be made in different directions and figures ; as the *rectilinear*, the
angular,

angular, that in form of a T, and the *crucial*; the first is proper, when we want to pursue a fissure; the others are seldom found useful; for when we have in view the making room for the application of the *trepan*, or *trepbine*, it is better to remove a circular or oval piece of the scalp. That great surgeon Monsr. *Arnaud*, says, he made the crucial incision, with success, upon the *temporal* muscle, contrary to the opinion of other surgeons; and I have twice successfully removed a considerable portion of it, to make room for perforating the skull, without leaving any impediment in the action of that muscle.— In making the incision, care should be taken to cut through the teguments and *pericranium* equally, and at once, using the edge of the knife more than the point, especially if we have reason to think the *cranium* is much broken and yielding; because if we plunged down the point, bearing hard upon it, we should, by that incautious step, be apt to depress the skull more, or perhaps injure the subjacent parts, by its slipping between the fragments. After having completed the incision in this manner, and raised the *peri-*
cranium

cranium a little from the bone, quite round, with the knife, the *scalprum* will be found the properest instrument to clear the bone, as we shall more particularly mention, when we come to describe the application of the trepan.

OF FISSURES.

WE shall first take under consideration the *counter-fissure*, with its several sorts.

1. Where the blow is on one side of the head, and the skull cracked on the other.
2. Where the internal table is broke, the external remaining sound.
3. Where the stroke is received on one bone, and the fissure in that adjoining.

A great many authors have doubted of the existence of a *counter-fissure*; and indeed it is a difficult task to account satisfactorily for such an effect, especially in the two first kinds. It would be only wasting time, to dwell upon the vague opinions that have prevailed in different ages, concerning the violent agitation the animal spirits are put into
from

from a considerable blow on the head, and the strong impulse they consequently make against the *cranium*; or to consider the comparison that has been made between the skull and an empty bottle, which struck on one side will sometimes crack on the other; or to debate the question about the subtle *aura*, said, by curious, speculative men, to be contained between the tables, that, upon a sudden shock or blow, may expand, and break the internal table, and not the external; we shall therefore only produce such testimonies of the facts, as to put the matter as much beyond controversy, as the nature of the subject admits of, leaving the curious to reason upon this abstruse point as they please. We shall not implicitly rely upon the authority of *Hippocrates*, *Galen*, *Celsus*, and other fathers of our art, though they mention the fact, and merit a great degree of confidence, as they seldom asserted any thing without having it confirmed to them by ocular demonstration; but we shall refer to those authors only, who relate what they were eye-witnesses of.—*Berengarius* says, he has seen three cases, where the *fissures* were opposite
to

to the parts which received the blows.—

Nicolaus Florentinus affirms his having seen a fracture, with a great collection of matter, on the contrary side to that which received the blow.—*Fallopious* says, that he has seen instances of this nature.—*Lessius* relates an example in a person, who received a wound upon his forehead, by a fall from his horse, and that after his death, a *fissure* was discovered in the *occipital* bone, with extravasated blood under it, without the least appearance of external injury on that part.—*Meek'ren* gives a singular instance of a person, who had only a contusion on the side, where he was struck, and two *fissures* on the opposite.—We might add the testimonies of *Paré*, *Tentanus*, *Dionis*, *Garengot*, *Mery*, *Petit*, *Arnaud*, and *Peyronie*, upon this occasion.

Tulpius mentions a very memorable example of a *fissure* in the internal table, caused by a ball, the external not being injured.—*Sculdetus* relates two cases, in which the internal table suffered, the external remaining unhurt.—*Paré* gives us the history of a nobleman's case, in which the internal table of the skull was fractured by a ball, though
the

the head was well guarded, with a helmet, and the external had suffered no manifest injury.—*Paaw* in his commentaries upon *Hippocrates, de Capitis Vulneribus*, assures us, he opened the head of a young man, who died three days after an accident, by a fall out of a cart, and found the external table sound, with a separation of a large portion of the internal.—*Petrus Spererius* says, that *Rinaldus Cortesius* had a skull in his study, in which the lower table was fractured, the upper remaining sound.

Paaw, in the above recited place, relates the case of a person, who was struck on the left *parietal* bone, near the *suture*, and, by that percussion, had the right fractured.—*Berengarius* mentions a similar accident.—*Ruyfch* has observed the same in a very remarkable manner.

From these convincing authorities, which I think cannot leave the incredulous in doubt, it may reasonably be concluded, not to mention any thing of my own remarks, that the various kinds of *counter-fissure* may happen, and the effect of a violent percussion be communicated from one part of the head

to another.—In all our inquiries and investigations, it is essentially necessary, to keep our minds as free as possible from prejudices, and not implicitly yield our assent to the doctrine or opinion of others, unless supported by matter of fact, and rational experience, in order to acquire true practical knowledge.

Having considered the *counter-fissure*, we shall proceed directly to that kind, which more frequently occurs.* When the *fissure* is large, it is soon discovered, after the bone is laid sufficiently bare, and the blood well sponged up ; but a *capillary fissure* requires great attention to discover it. The method proposed by *Celsus* and others for this discovery, is to pour ink, or some other coloured liquor, upon the suspected part of the bone, and then to wipe it dry with a sponge ; when some of it will have insinuated itself into the crack, not to be expunged, or even obliterated by a little scraping of the bone ; which indeed may serve to show the *fissure* still plainer.

In

* Vid. *Wagner de Contra-Fissura, & Le Maire de Resonitu.*

In order to know whether the *fissure* penetrates both tables of the skull, *Berengarius* proposes, in his treatise *de Fractura Cranii*, that the patient should hold his breath, having his mouth and nostrils closed, driving, as he expresses it, the air with the utmost force from his breast to his head, and says, that if the *fissure* penetrates both the tables, moisture will appear through the crack; but this experiment is not to be depended upon, though so great an authority may be added, as that of *Fabricius ab Aquapendente. Guido*, &c. have proposed other means, which are equally fallible.

Since *fissures* are so difficult to discover, and the passage is too narrow for the egress of extravasated blood, &c. they frequently produce worse effects than fractures; and in them, a concussion of the brain is more to be apprehended, than in large fractures, for obvious reasons. These considerations demand the most diligent and judicious inquiry at the very first, in order to obviate future evils. The instance which *Paaw* gives in his commentaries upon *Hippocrates de Capitis Vulneribus*, is very striking, of a person,

who ten months after having received a *fissure*, which had passed unobserved, was seized with a *vertigo*, and died in a short time. In this case, after the patient's death, the bone was found carious, and the brain corrupted.

Hence appear the sad consequences of delaying to perforate the bone, by the trepan ; and, as that operation is attended with little or no pain or danger, we should not from the present absence of threatening symptoms, by any means be deluded to procrastinate, nor, I think, be induced by any authority to trust to other methods, not even to *Belloste's* favourite one of making terebrations to the *diploë* under a persuasion that the *fissure* penetrates no farther, a case which I believe rarely happens ; but should it not proceed through both tables of the skull, yet the *dura mater* may probably have suffered under that very part, laying the foundation of future mischief : and in the case just mentioned early trepanning probably would have saved the patient. The happy event in some cases without the operation, may have had too
much

much weight with the timid and unexperienced.

A *fracture* is the second kind of injury of the skull; the definition of which differs from that of a *fissure*, which is no more than a simple solution of continuity of the bone, whereas by a *fracture* is understood a separation of one or more pieces from it. This accident requires immediate trepanning, as the fragments of the bone irritating and injuring the *dura mater*, may be soon productive of irreparable mischief, as I have often observed; unless they can be removed by some other method without detriment to the subjacent parts.

A *fracture* of the skull is divided into three kinds. 1. That, in which one or more pieces are entirely separated, and not much depressed. 2. That, where the fragment or fragments lie wholly or partly under the sound bone, which is the worst case that can happen, on account of the difficulty of extracting or elevating them. 3. Is when the piece rides upon the sound part of the bone; which is a bad circumstance, as its lower

part may sink down, penetrating the meninges and brain itself.

The applications proper, after removing the fragments of the bone by trepanning, or otherwise, as the exigency of the case demands, are such as the membranes, the bone, and the scalp require respectively, which will be specified after the operation of trepanning.

The third kind of injury, which we have in order mentioned, is a *contusion* of the skull. It may be occasioned by a fall, by striking the head against some solid body, by some heavy weight falling upon the head, or by a blow with an obtuse weapon. By such violence, the vessels belonging to the bone may be injured, and the course of their fluids obstructed, whence may arise worse consequences, than from *contusions* of the soft parts; for if not discovered, and the bone laid bare in time, it may grow carious, and produce most dreadful symptoms.—*Schenkius* speaks of a gentleman, who received a wound on his head by a bullet, which was soon healed, but after that he was afflicted with a perpetual

petual head-ach for many years ; on which account, various methods were tried, but in vain ; at length the *cicatrix* opened of its own accord, and the bone was found carious ; upon the separation of the affected from the sound part, the patient perfectly recovered, without any pain of his head remaining.—The same external injuries may extend their effects farther ; the vessels, connecting the *dura mater* to the *cranium*, may be ruptured, causing a separation of these parts ; whence extravasations of blood, inflammation, supuration, and ulceration upon that membrane, may ensue ; under which circumstances, nothing but trepanning can bring relief.*

S 4

The

* Doctor *Van Eems* in *Prælect. Academic. Leydens.* speaking of the vessels of the *dura mater* which attach it to the skull, says :

“ Nunquam neglexi occasionem hanc rem accuratius
 “ inquirendi, & nosocomium publicum hanc opportuni-
 “ tatem mihi dedit. Juvenis & robusta puella moriebatur
 “ vera phrenitide, ejusque cadaver coram auditoribus,
 “ paucis post mortem horis, aperui. Quando olla cranii
 “ erat ablata a subjecta dura matre, in tota ejus superficie,
 “ qua cranium spectat, non inveni ullum punctum, mi-
 “ croscopio distinguendum, ubi non erat guttula san-
 guinis

The fourth sort of hurt the skull may receive, is a *depression*, and from the same cause as a *contusion*. Some surgeons deny the fact peremptorily, except in young subjects, in two of which I have seen it, in a very remarkable manner, but never in an adult, without a fracture ; yet I can conceive some skulls may admit of it, and several authors of the best credit confirm it, as we may see in a collection of examples in *Stalpart Vander Wiel*.—*Hildanus* relates the case of a smart boy, who became stupid by such an accident, gradually losing his memory and intellectual faculties.

The patient is liable to all the symptoms under this accident that attend a *contusion* of the skull ; and worse may more immediately ensue, by compression, as the skull is completely filled with the *encephalon*.

The ancients recommended various methods of raising the depressed parts of the skull. The use of *cupping-glasses* has been
advised

“ guinis rubri, & cava olla cranii ablata, etiam non ex-
 “ hibeat ullum punctum, quod non ostendebat talem
 “ guttulam sanguinis respondentem guttulæ, in superficie
 “ duræ matris visibili.”

advised by some, and among them, the great practitioner *Hildanus* : others, have directed the application of an adhesive plaster, having a string affixed to it, to pull it up with ; but these methods are insignificant. It is much more probable, that forcibly pulling up the scalp should separate it from the *peri-cranium*, than raise the depression of the bone. *Paaw's* method is too irrational, to take any particular notice of it, and that, recommended by some writers, with a screw fixed into the depressed part of the skull, in order to elevate it, is liable to many objections, that can want no explanation. It is very astonishing, that such great masters should fall into such gross absurdities ; but, according to *Scultetus* and others, it is better to leave the work to nature, than practise any of these methods, which are exploded by the moderns : but when the functions of the brain are hurt, by a depression of the skull in children or adults, trepanning is advisable, making as many perforations as shall be found necessary, to give an opportunity of pursuing such other measures, as the urgency and circumstances

of

of the case may require, as will be hereafter directed in the article of trepanning.

The fifth kind of injury, that the skull may suffer, is a *cut*; which may properly be divided into three sorts. 1. The perpendicular. 2. The oblique. 3. Excision, or that which carries off a piece of the bone with the teguments.—The perpendicular *cut* differs but little from a *fissure*; it is easier discovered, and not attended with such contusion of the teguments and bone; consequently is generally less dangerous.—The oblique is worse than the perpendicular, as blood or matter may be apt to lodge under the sloping wound; but on the other hand, there is less hazard of having the *encephalon* wounded.—Excision, if it penetrates no farther than the *diploe*, is rather less dangerous than either of the other, and it is to be treated as a wound with loss of substance. Where the scalp is not totally separated, having the piece of the bone adhering to it, some surgeons have proposed and advised dissecting that off, clapping down the scalp over the sound part of the bone, and keeping

ing

ing them in compact by easy comprefs and bandage.—*Stalpart Vander Wiel* has collected precedents from writers of good credit, to encourage the practice; and mentions fome, even where both tables of the fkull have been hewed off, that have ended happily by this treatment, without any exfoliation.—*Berengarius* relates the cafe of a gentleman, who was wounded in the forehead, fo that the fcalp, with a piece of the bone affixed to it, hung down over his eye; this experienced furgeon feparated the piece of bone from the fcalp, proceeded as we have mentioned, and cured his patient in a fhort time.*—*Fallopious* gives a fimilar cafe.

* *Job a Meck'ren* has introduced, among his furgical operations, a ftrange ftory of a *Ruffian* nobleman, who had fuch a defect fupplied, by a furgeon, from a dog's head; but the bigotted divines of that country excommunicated him, and would not annul the fentence, till he fubmitted to have the brutal part of him removed.

There is, I think, in the *Philof. Transf.* an account of a fingular operation performed by a furgeon, who after diflecting off a cock's fpur, with as much flefh upon it as he could, ingrafted it into an incifion made upon his comb on the top of his head, where it firmly grew.

case.—*Petrus e Langelata* assures us, he has taken such measures with success.—*Paré* speaks of an extraordinary case of this kind, successfully treated by him in the same manner.—*Belloste* in his Hospital Surgeon, has a most dreadful case, which terminated very happily, of a girl between eleven and twelve years old, who had received eighteen or nineteen wounds upon her head with a cutlass, comprehending every species of wound here mentioned.

All these wounds require the same treatment, we have already directed; but it certainly would be in vain to attempt the method of cure, which has been recommended to the consideration of surgeons in the third species, or *excision*, except in recent cases.*

A SHORT

* Professor *Monro* speaks of a person, who in an engagement with a privateer, received a wound upon the middle of the *os frontis*; which, though it was soon healed apparently, yet left a continual pain of the part. Some time after his return home the wound broke open, upon which incident the pain abated, but a deep and extensive *caries* was found in the bone by the professor, to whom he applied after having been under the care of other surgeons to no purpose. The carious bone
was

A SHORT DESCRIPTION OF THE MATERIAL PARTS OF THE ENCEPHALON.

THERE is an intercourse between the *pericranium*, *meditullium*, and *dura mater*. The *dura mater* is an inelastic membrane, about the thickness of parchment, lining the internal surface of the skull, as the *pericranium* encompasses the external, to which it is attached by a greater number of vessels, and more strongly in children than in adults, giving a covering to every nerve in its passage out of the skull. The *falci-form* process
of

was not black, but of an ash-colour, and full of small, like worm-eaten, holes, and the discharge was large, ichorous, and very foetid. This practitioner of great discernment, was apprehensive that the *caries* penetrated, at least as far as the *diploë*, if not quite through the bone. From this consideration he resolved to apply the trepan, and make such a number of perforations as were necessary to encompass the carious part of the bone, and found it affected to the *diploë*, about the breadth of the palm of his hand, which he easily raised from thence, except in one small space where he left it to exfoliate; and cured his patient, after this operation, by the common treatment.

of the *dura mater*, running according to the course of the *sagittal* future, and longitudinal *sinus*, divides the brain into the two hemispheres; and the transverse process is in the course of the *lambdoidal* future and lateral *sinuses*, separating the *cerebrum* from the *cerebellum*; which processes, forming a kind of triangle, serve to prevent a vacillation of the brain, being assisted by the entrance of the vessels of the *dura mater* into the skull, as described.

—The *pia mater* is one of the most delicate vascular membranes, immediately investing the brain, in all its convolutions or plicatures; it is so fine and transparent, that the brain appears clearly through it; its external surface is connected to the *dura mater* by veins, opening into the *sinuses*; its internal is attached to the brain by *capillary* vessels, called *vasa tomentosa*.—The brain is composed of a cortical, and medullary part; the first is of a brownish, or rather cineritious colour; the other white, and of a firmer texture; both substances are vascular, but the cortical more so than the medullary, from whence the nerves proceed.—The *cerebellum* lies below the posterior lobes of the *cerebrum*;

cerebrum; it has no convolutions, like the brain, but it has curved parallel lines, described upon its surface by the *pia mater*, and is of a darker colour than the *cerebrum*.——

Under the *cerebellum* lies the *medulla oblongata*, improperly so called, for it is rather of a depressed pyriform figure. This part is formed by the union of the *medullary* substance of the *cerebrum* and *cerebellum*; whence proceeds the *medulla spinalis*, which is also to be considered as a continuation of the brain, with its thirty pair of nerves divaricating from it: and from this connexion of the nervous system, we may account for many appearances, though not in so satisfactory a manner as we wish.*

OF

* Read the late professor *Whytt's* excellent book concerning the sympathy of the nerves and nervous disorders: and what doctor *Hales* has said in his *Statical Essays*, vol. 2. pag. 59 and 60: which kind of nervous sympathy I have lately experienced, in an illness, to a great degree.——Also read my ingenious friend doctor *Kirkland's* *Dissertations concerning the Brain and Nerves, and the Sympathy of the Nerves and Irritability.*

OF THE INJURIES WHICH THE ENCEPHALON,
OR PARTS CONTAINED WITHIN THE SKULL,
MAY SUFFER.

THE *encephalon* may suffer. 1. By concussion. 2. By compression. 3. By irritation. 4. By being wounded with cutting instruments, or fragments of bones. 5. By ruptures of veins, arteries, or lymphatics, proceeding from concussion, or some other cause, and occasioning extravasations upon the meninges of the brain. The coats of the vessels, which are ramified in, and upon the plicatures of the *pia mater*, connecting it to the *dura mater*, are very weak and tender; consequently easily ruptured by concussion. 6. By inflammation; whence may proceed abscesses, or collections of matter. Though pure blood extravasated, never changes into purulent matter, yet it is apt, after coagulation, to be rendered fluid by intestine motion and putrefaction; becoming then so acrimonious and stimulating, as to produce in the parts, where it is lodged, an inflammation;
in

in consequence of which, *pus* may be formed and mixed with it, which appearance, probably, has deceived inattentive surgeons into an opinion, that blood is transmutable into *pus*. 7. By a detachment of the *dura mater*; whence may proceed extravasation, inflammation, and an ulcerous foulness, or sloughing of that membrane, proving of the most dangerous consequence, as we have remarked under the article of contusion of the skull.*

This variety of causes will be productive of a great variety of symptoms or effects, sooner or later; as bleeding at the nose and ears, head-ach, restlessness, inflammation of the eyes, fevers, vertigo, stupor, loss of senses, as seeing, hearing, &c. deprivation of speech, and voluntary motion, difficulty of respiration, coma, palsy, involuntary emission of fæces and urine, apoplexy, and convulsions; and then death soon closes the dismal scene, unless nature can be assisted by art.

VOL. I.

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Some

* See Mr. *Pott's* judicious Practical Treatise on this subject.

Some of these symptoms attend every injury done to the *encephalon*, sooner or later, more or less, according to the degree of obstruction to the circulation, inflammation, oppression of the brain, &c.—Pain and heat of the head, with redness and wildness of the eyes and looks, attended with fever and a tense pulse, denote an inflammation upon some part of the *encephalon*, which frequently in a short time terminates in delirium or phrensy : and when matter is forming, in consequence of inflammation, the patient is commonly subject to rigors.—When the brain is oppressed by extravasation or otherwise, the nerves are affected, the pulse generally becomes depressed and irregular, and other symptoms supervene, to a degree in proportion to that oppression, &c..

From these considerations we must infer, that the assemblage of symptoms will generally be of a mixt nature ; and the surgeon must pay the utmost attention to them, to avoid falling into error of judgment, in declaring his sentiments in such a doubtful matter, which will not admit of a precise determination.

How far a concussion of the brain, affecting the origin of the nerves, without any other evident cause, may excite disorders in the nervous system, &c. is too abstruse a point for us to attempt to elucidate.*——

A concussion of the brain may happen, without the head being the part immediately shocked; of which we have instances; and the like I once saw. We have also the fatal effects of concussions demonstrated to us by dissections, where only the blood-vessels have been found turgid, without any rupture of them. A very remarkable case of this kind I had an opportunity of observing, some years ago, by opening the head of a boy, who had received a fall a week before, and who from the time of the accident, till the day before his death, was almost incessantly singing. Upon the strictest examination, I could discover no extravasation or ruptured vessels, but those distributed in the folds of the *pia mater* appeared very turgid. When this fatal accident happened, the boy was

T 2

learning

* Vid. *Bohnius* in *Renunciatione Vulnerum, de Vibracione Cerebri* pag. 172: *Et Berengarium de Commotione Cerebri.*

learning psalmody ; and it was observed by those who attended him on this occasion, that his voice was more melodious after than before it, and that he sung the tunes as truly. The day before he died he grew comatose, and expired in strong convulsions upon the seventh day after the accident.

Hippocrates, and other ancient writers, as well as the moderns, have observed, that when a paralytic disorder seized a person, in consequence of an injury done to the brain, it was generally on the opposite side to that which received the blow. It has also been observed, that sometimes the other side has been convulsed at the same time ; as indeed I lately saw, in a very singular case, where the breech-pin of a gun, near three inches long, was lodged out of sight in the left hemisphere of the brain.*—*Bonetus*, *Hildanus*, *Valsalva*, and others, mention cases in which extravasations were found, upon opening the heads of patients, who had paralytic symptoms of their limbs on the opposite

* See this case in the second volume.

posite sides. The most eminent writers and accurate observers agree, that it more frequently happens thus ; were it invariably so, the remark would, on some occasions, be a considerable direction to our judgment and practice.—Some speculative men have attempted to account for this appearance, by admitting a decussation of the nerves,* and assigned reasons for the injured side being thrown into convulsions at the same time : but let us leave these controverted, knotty points, to be discussed by the curious investigators.†

T 3

As

* *Cassius*, a man of great note, one of *Asclepiades's* pupils, and his successor at *Rome*, was of this opinion ; but modern anatomists do not allow a decussation of the nerves.

† *Valsalva* and *Morgagni* say, that in dissection of bodies dying of hemiplegias, they found the brain affected on the opposite side.—Vid. *Adversar. anat. Morgagni* 6 & *Animadvers.* 84.—A man, aged twenty-five, was seized with a fever, attended with a violent pain on the left side of his head, and not relieved by any means. He was not sensible of ever having received any external injury ; but after about two months continuance, a tumour appeared upon that part, and he fell down in an apoplectic fit, the opposite side becoming paralytic, with total loss of speech

As the parts within the skull affected with inflammation, extravasation, &c. or where there is a *fissure* without appearance of external injury upon the scalp, are so difficult to discover, we must, under such perplexity, deliberately consider the symptoms, and how the accident happened, with every circumstance, that can possibly throw any light upon a matter of the utmost importance for the preservation of the patient's life. Sometimes, though the patient's senses are much impaired, as we have mentioned, he lifts his hand to the part affected; at other times, they are entirely taken away and we are deprived of that assistance to direct our judgment. Here we want the greatest sagacity; for not being able to find out precisely the situation of the disorder, it generally proves mortal.

Hippocrates relates an extraordinary case to this purpose, of a girl, who, by one of her play-

speech for some days. Soon after his death I was present at opening his head, and we found a great quantity of fetid matter diffused about the plicatures of the brain, &c. and probably the apoplectic fit happened when the abscess burst.

play-fellows, was struck with the hand upon the *sinciput*, and became immediately blind ; soon after, she was seized with a violent fever, accompanied with a pain of her head, and an inflammation of her face and eyes ; on the seventh day, a considerable quantity of a bloody fluid issued from one of her ears ; on the eighth, she grew lethargic, and died on the ninth.—*Hildanus* has a case something like this.—*Heurnius*, in his Commentaries upon *Hippocrates*, says, he has known some persons lose their taste and smelling all their lives, in consequence of falling upon the *occiput* : and there are many instances upon record, well authenticated, where the speech has been affected for a long time by concussions of the brain.—*Valle-riola* tells us of a boy, who was struck on the head with a small stick, without any symptoms of fracture or *fissure* immediately ensuing, or any appearance of contusion upon the scalp ; but on the sixth day it inflamed, and then the patient was attacked with a palsy and convulsions, becoming delirious soon after, and died on the eleventh day.—The same author mentions the case of a

vintner, who was struck with a stone on his head, without apparently injuring the skull, yet on the fourteenth day he died: and upon opening his head, an extravasation of blood was found upon the *dura mater*.——* *Bobnius* and † *Bonetus* have many such singular cases.——The great professor *Monro* instances the case of a painter at *Edinburgh*, who received a blow with a stone on the back part of his head, making a small wound in the scalp. He refused to be let blood immediately after the accident, and walked near a mile to town; was then bled freely, and properly treated in all respects; yet, within a few days, he was seized with a lethargy, and other usual symptoms of an oppressed brain, and expired soon after. Upon opening his skull, neither fracture nor fissure appeared; nothing more was visible, than a small extravasation of blood, with a turgescence of the vessels.

Hence we see, that in consequence of seemingly slight causes, the *encephalon* may suffer

* *De capitis vulneribus lethalibus in renunciatione vulnerum.*

† *In Anatomia Practica.*

suffer to a fatal degree : and under the circumstances we have been relating, the intentions are, to cure the inflammation, remove the compressive cause, whatever it is, &c. On account of the inflammation, attending a fracture or fissure of the skull, &c. we must pay a due regard to the antiphlogistic method, venesection in particular, and prevent, all we possibly can, the falling of blood upon the *dura mater*, &c. and if that has already happened, we must then endeavour to evacuate it speedily ; for by its stagnation, it soon becomes putrid and acrid, corroding the membranes, &c. the dismal consequences of which, we may read in *Schenkius*, *Tulpius*, *Wiseman*, *Meek'ren*, *Vander Wiel*, *Hildanus*, and other observators, and in the *Acta Eruditorum Lipsiæ*.

When a piece of the skull is depressed, and happens to be slipped, and immoveably fixed under the sound part of the bone, we must apply the trepan ; making such a number of perforations, as we find necessary to disengage, and extract it with ease. Sometimes the internal surface of the depressed fragment, or fragments of the skull may
be

be a great deal broader than the external, by breaking off from the internal table, the external opposite thereto remaining unhurt ; in which cases, many perforations may be found requisite, for the easy and safe extraction of the depressed piece or pieces. Within three or four years, I have been concerned in three cases, in each of which we made four perforations ; in two of them we extracted five pieces, and in the other four, with great ease ; the extraction of which would have been impracticable by any other means, on account of their internal surfaces being much greater than their external. We made the perforation in a line, in the most depending parts, a circumstance that should always be particularly attended to, for the free and uninterrupted discharge of the matter.*

When the symptoms are threatening, and we have no visible marks to direct us, to the affected part of the interiors of the head, all we can do, is to have recourse to plentiful venesection, repeating it according to the patient's

* See two cases, and pl. 2. in Vol. II.

patient's strength and constitution, and use lenient purgatives and diluents freely, observing a very strict regimen, and embrocating the whole head, after being close shaved, with *ol. rosar. & acet.* Bleeding is to be particularly insisted upon; for by diminishing the quantity of blood, its impetus will be abated, the vessels consequently less distended, and those ruptured will be more readily united, preventing the danger of more blood being poured out. This evacuation will greatly contribute to the removal of obstructions in the small vessels, by making the circulation freer, and of course promote absorption of the extravasated fluids. We have from *Wise-man* a singular instance of the good effect of bleeding, in the case of a gentleman, who was thrown off his horse; upon which accident, several of the symptoms, attending a concussion of the brain, &c. supervened, but were removed by plentiful and repeated bleeding; and indeed much more plentiful at last, than was intended, by an odd accident, upon opening the *jugular* vein, which had been opened several times before. This case is the most worthy attention, for our encouragement

agement in this practice, and should be read at large. See book 5. chap. ix. observat. x. of his excellent works.—*Paré* mentions a very pertinent case on this occasion.—I was consulted a few years ago, for a clergyman, of a robust and sanguine habit, who, by a fall from his horse, had received a *fissure* upon the *occipital* bone, which was attended with most threatening symptoms. In repeated consultations of a physician and several surgeons, trepanning could not be unanimously agreed upon till the eleventh day after the accident, for want of well authenticated precedents to encourage the practice upon that part: however, in this time, at least a hundred ounces of blood were taken away; which evacuation, I believe, proved the means of preserving his life. The appearances upon performing the operation, which I had urged in the strongest terms at every meeting, demonstrated the absolute necessity of it, the *dura mater* being inflamed, and having a fetid, bloody *ichor* upon it.—In attending a gentleman since, of a strong constitution, with an uncommon *fissure* on the *os temporale*, I had also the opportunity of observing

observing the happy effect of copious bleeding, even after trepanning, violent systems still continuing. In the first eight days, whilst he lay constantly either in a *stupor* or a *delirium*, more than a hundred ounces of blood were taken away, by the concurrent opinion of two eminent physicians; and in the whole, during the cure, above double that quantity, nothing giving relief, on account of delirious symptoms, which returned at times to a great degree, but this evacuation. The blood had the thickest and toughest buff-coloured size we ever saw. In a reasonable time he recovered as good a state of health as he had before the accident, with the perfect enjoyment of his mental faculties.—Both these cases are related fully in the second volume of this work.

Purging

* I have seen singularly good effects from opening the *temporal* artery in concussions of the brain, &c, as well as in other disorders of the head, not proceeding from external injuries; and I scarce remember an instance where it has been opened, on such occasions, without giving relief, more or less. About three years ago I opened it, with the approbation of a physician, for a person apparently in *extremis*, under a fit of the *apoplexy*; whilst he

Purging is recommended by all writers, ancient and modern, on these occasions; but it must be by medicines of the gentlest and least stimulating kind, and by no means such as heat the blood and increase its velocity, which would consequently add to the inflammation, &c. This evacuation is of great consequence to be attended to, on many accounts, and may assist in preventing an *abscess* of the liver, &c. that has frequently been taken notice of by observers, when treating of the injuries now under consideration, by which the patient may lose his life even though the disorder in his head should be

was bleeding he was evidently relieved, and it appeared to us that his life was owing to this seasonable operation.—A great many years ago, I opened it, in the presence of Sir *Benjamin Wrench*, then a physician of great character in *Norwich*, on account of an obstinate *vertigo*, which had long resisted his prescriptions; and during the bleeding, the complaint left the patient, returning no more; at which happy event the good old knight, my singular friend, whose memory I revere, expressed great astonishment.—See what *Marcus Aurelius Severinus*, the great *Neapolitan* surgeon, says upon *Arteriotomy*.—When doctor *Butter* took his degree a few years ago at *Edinburgh*, *Arteriotomy* was the subject of his *Thesis Inauguralis*.

be cured, as is exemplified by *Job a Meek'ren*, in his letter to *Barbette*, chap. ii. of his *Medico-Chirurgical Observations*.——*Monf. Bertrandi* has a dissertation on this subject, to which are subjoined observations in support of it, by *Monf. Andouille*, in the third vol. of the *Mem. de l'Acad. Roy. de Chirurgie*.——*Pouteau*, in his *Melanges de Chirurgie*, particularly mentions it, and also attempts to give a rational solution, how it proceeds from injuries of the head.——*Paré* and others have observed *abscesses* upon other of the *abdominal viscera*, proceeding from the same causes.

Besides *venesection*, and gentle purging, occasionally, in order to obviate bad consequences, or remove them, the patient's diet should be strictly regarded, which should consist principally of the farinaceous kind; his drinks should be of a resolving nature, taken warm and very liberally, that moisture, by the exhaling vessels, may be conveyed to the extravasated fluids, sufficient to preserve or bring them into a state of fluidity, fit for absorption by the bibulous vessels: and medicines of the nitrous, attenuating kind, should be joined with these diluting liquors, as the
viscosity

visciditv of the blood and febrile symptoms shall indicate.—When the head is intensely hot and painful, *ol. rosar.* or *olivar.* mixed with vinegar, makes a good topical remedy ; and *sal ammon. crud.* dissolved in the vinegar may add to its efficacy ; but we must not forget to have the head shaved close all over, before the use of any embrocations. Under these circumstances, spirituous applications are very improper.*

Celsus, *Berengarius* &c. advise lenient applications to be made to the ears, when a discharge is observed to proceed from them, in order to assist nature's effort, which she sometimes makes to the patient's great relief or entire cure.—*Stalpart Vander Wiel* tells us of a woman at the *Hague*, who, by a stroke with a round stick upon one of the *parietal* bones, had, soon after the accident, symptoms denoting an injury of the *encephalon*, and was cured by an evacuation of a ferous, bloody

* An experienced surgeon of great judgment, assured me he once saw dreadful effects, from the use of strong spirituous fomentations and embrocations, in a contusion upon the head ; which alarming symptoms vanished by different treatment.

bloody fluid from her ear. This case, he says, he saw himself; and relates a similar one, from *Langelottus*, which is also inserted in the *Miscellanea Curiosa German.*—I observed the same, some years ago, after a violent concussion of the brain, in a boy about twelve years of age, who recovered; and probably this discharge from his ear might save his life.

Should not the means we have been mentioning succeed, in the removal of the symptoms, as soon as we can discover any appearance, to direct us to the part affected, though only with a strong probability, it is rational, and certainly justifiable practice, to proceed forthwith to manual operation; considering, as we have said, that the operation of trepanning is not in its nature dangerous, and delay may prove of fatal consequence, as *Hildanus* informs us happened to a young gentleman, who was committed to the care of an ignorant surgeon, that would not have recourse to the trepan, though plainly enough indicated; and the patient died a few days after.—*Sculdetus* gives an example of a person, who lost his life by a neglect of this

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operation. The clergyman before-mentioned must inevitably have perished, had it not been performed ; in whose case the propriety of it was evidently consistent with the principles of surgery, though the *fissure* was upon the *occipital* bone, yet that circumstance occasioned the demurs in the several consultations ; and indeed the operation has been rather too much discouraged, upon that part, by men of the most respectable characters, whose weight and authority make it very necessary for them, to be exceedingly cautious of what they publish, as it will be an example to regulate and determine the conduct of others, who may not have confidence in themselves, for want of experience.

When a *fissure* and *concussion* are complicated, it sometimes happens, that the symptoms, properly belonging to the latter immediately upon the accident, remit so much upon bleeding, scalping, &c. as to delude the surgeon into hope and belief, that he may succeed without trepanning ; yet, notwithstanding appearances become more favourable, in consequence of such measures having been taken, the most direful symptoms may
come

come on unexpectedly, many days or weeks after, from extravasation, inflammation, &c. upon the *encephalon*, of which we have innumerable instances; some I have seen; two indeed of a very singular nature, where the remission of the symptoms was offered, as a reason for procrastinating the operation, till the *dura mater* was much inflamed under the *fissures*, to the great hazard of the patients; and this is a point that demands the utmost regard.—These considerations should make us circumspect in our *prognostics*, and very attentive in our practice, in order to prevent fatal consequences. The most accurate and judicious observers have considered the symptoms, that supervene some time after the accident, as more threatening than those which happen immediately, and the reasons are too obvious to want illustration.

OF WOUNDS OF THE BRAIN.

BEFORE describing the operation of the trepan, we shall give a short account of wounds of the brain. These wounds, made by cutting or other instruments, depressed fragments of the skull, &c. have always been classed with those of a mortal nature : but the many authentic histories we have upon record, of wounds of this part having been cured, should teach and encourage us, never to leave our patients in such deplorable circumstances, without exercising our art and skill to the utmost of our power ; giving them comfortable hopes of cure, and concealing the dangerous truth from them, but making, at the same time, a proper *prognostic* to the relations, friends, and by-standers, in order to secure our reputations against censure and ill interpretations ; as there generally are people ready enough to give their opinions without authority or reason.

These wounds are attended with such symptoms as we have enumerated in injuries
done

done to the *encephalon*. The same applications are proper for them, as for wounds of the membranous parts, as *ung. e gum. elemi*, natural *balsams*, &c. as have been specified, avoiding all oleaginous things. The medical and dietetic rules, &c. may be collected from what has been already said.

HISTORIES OF CURES OF WOUNDS OF THE
BRAIN, EXTRACTED FROM GOOD AUTHO-
RITIES.

GALEN mentions a case that succeeded, in a youth at *Smyrna*, wherein the anterior ventricles of the brain were opened.—*Nicolaus Massa* speaks of the happy event of a wound, that penetrated as far as the *sphenoidal* bone, as appeared by the introduction of the probe.—*Amatus Lusitanus* has a remarkable history of a man, who in fighting a duel, near the city of *Rome*, received a thrust with a sword through the forehead into the brain, and was cured in fifty days, contrary to the presage, and to the great astonishment of the surgeons, who had the care

of him.—*Hildanus* relates the case of *Horstman's* sister, who was cured by him of a wound in her brain, caused by some depressed fragments of one of the *parietal* bones; and mentions his master *Slotanus's* visiting the patient with him. He also speaks of a similar case, that ended happily, where another surgeon had prognosticated a fatal event, —*Glandorpius* gives the history of a robust man, who received a fracture upon his skull, out of which was taken, by his father *Ludovicus Glandorpius*, a large portion of the brain, after extracting some fragments of bone. In this case, though the wound was cured, yet the patient remained paralytic on the opposite side, and could never bear the noise of drums, trumpets, or guns.—*Nicolaus* speaks of a man, that received a wound upon the *vertex* into the substance of the brain, who, the day after the accident, became paralytic, vomited, and had the common symptoms attending it. He ate nothing during six days, and drank nothing but cold water sweetened with syrup of roses; after which his appetite returned, and he recovered to admiration.—*Jacobus Berengarius Carpenfis*

Carpensis says, he has been an eye-witness to the recovery of six persons, from wounds of the brain ; though two of them became paralytic on one side, but he does not mention on which.—*Brassavolus* asserts, he has seen wounds of the brain cured ; in one person, he says, as much of the brain was evacuated, as would fill a hen's egg-shell ; but though the wound was cured, the patient had ever after a great impediment in his speech, and at length grew stupid. The same author mentions another patient, with an extensive fracture of the skull, and loss of a great quantity of the brain, whose life was saved, but he was deprived of speech and understanding.—*Horatius Augenius* relates a very singular case of a wound of the brain cured.—*Franciscus Arcæus* gives us the narrative of a workman, employed in building a tower at *Valverde*, who, by a stone of twenty-four pounds weight, falling from a great height upon his head, had his skull fractured, with fragments driven into his brain. For the space of three days he lay speechless, and almost lifeless ; after the eighth day, his head opened spontaneously, from the *sinciput* to

the *occiput*, in the course of the *sagittal* future, and discovered collections of matter; soon after, his speech returned, though imperfectly, and his eyes, which had been quite closed, opened; about twenty days after, he began to distinguish objects, and recover his intellectual faculties, and in four months, he was perfectly recovered.—Mr. *Younge*, a surgeon of eminence, who lived at *Plymouth*, recites many more successful cases, from the best authors, which may encourage us not to despair, in his treatise upon this subject, that he was compelled to publish, in the year 1682, in defence of himself, by the dissingenuous and illiberal treatment he met with from a physician, who would not admit that wounds of the brain could ever be cured; but obstinately disputed a well attested fact in a patient of his, whom he had cured of such an accident.*

* The case of Mr. *Laudir*, a celebrated operator in surgery at *Edinburgh*, who some years ago received a fatal fracture upon his skull by a fall from his horse, was very surprising to all the surgeons concerned. In the *meatus auditorius externus* was found a small portion of the brain, from whence also at first proceeded a great effusion

effusion of blood. The *os occipitis* was separated from its connection with the *parietal* and *temporal* bones on that side. A probe passed very easily through the *meatus auditorius* to the brain ; and upon opening the head after death, a fracture was discovered, which extended into the *foramen magnum*——*Home* has a pertinent case in his *Medical Facts and Experiments*.

See *Remarques sur les playes du cerveau en Mem. de l'Acad. Roy. de Chirurgie*, tom. I. par *Monf. Quesnay*.—— In this *Mem.* he takes occasion to recommend the application of the trepan to the *frontal sinuses*, which I have also practised without inconvenience.——Disorders may attack these *sinuses* requiring the use of the trepan, that cannot be remedied by any other means ; as a collection of matter in consequence of inflammation upon the *membrane* that lines the cavity, exclusive of external injuries.——Insects of various kinds have been found in these *sinuses*, according to *Monf. Littre* and others,

OF TREPANNING.

HAVING gone through the various accidents incident to the head, and shown the great utility, and absolute necessity of trepanning, in order to elevate, or entirely remove, depressed fragments of the bones, and to evacuate extravasated blood, sanies, &c. oppressing the brain, and producing the train of evils, we have given a detail of, we shall proceed to the manner of performing this very necessary operation, after taking notice of the parts we are advised to avoid in it, by the most eminent practitioners; though, indeed, there appears scarce any part of the *cranium*, from the frontal *sinuses* to the insertions of the muscles into the *occipital* bone, that may not be perforated with safety. There are some late instances in this kingdom, where the trepan has been successfully applied to the frontal *sinuses*; and in a case wherein I was lately concerned, we found a necessity of taking in part of one of them, whence proceeded no inconvenience.—How far

far it might be practicable, to separate the muscles from, and apply the trepan to the inferior part of the *occipital* bone, almost to the *foramen magnum*, may be worth future consideration ; as it is no unreasonable supposition, that a case may happen so circumstanced, as to admit of no other remedy, and, according to *Celsus*, a doubtful one is better than none.*

The parts of the skull not eligible for the application of the trepan are. 1. The frontal *sinuses*. 2. The *sutures*, in young subjects ; for in old ones the adhesion of the *dura mater* to them is but little more, than to other parts of the *cranium*. 3. The middle of the *os frontis*, towards the nose, where the *spinal* process of that bone projects considerably.

* *Bontius*, a writer of the best credit, relates a singular case of a sailor, whose head was crushed between the ship and a boat, in consequence of which dreadful accident, the greatest part of the *occipital* bone was taken away in fragments, almost as far as the *foramen magnum*, and the patient perfectly cured by him and another surgeon.—See a pertinent case, where the trepan was successfully applied to the inferior part of the *occipital* bone, in the *Edinburgh Medical and Philosophical Commentaries*, numb. vii. pag. 313.

siderably. 4. The anterior and inferior angles of the *parietal* bones, on the internal parts of which, run the arteries of the *dura mater*. 5. The *sagittal suture*, on account of the longitudinal *sinus* running immediately under it. 6. The *lambdoidal suture*, under which lies the course of the *lateral sinuses*. 7. The *occipital* bone, on account of its great inequality of thickness, and irregularity of its internal surface. 8. The *os temporale*, as the *temporal* muscle must unavoidably be wounded in making room for the trepan: and lastly, we must be careful, not to apply it to a yielding fractured part of the bone, that will not resist the necessary force in making the perforation.

There are instances from the best authorities, of the successful application of the trepan to all these exceptionable parts, to encourage a cautious and judicious practitioner, upon emergencies; to which, I will venture to join my own experience, hoping it may have some weight, in determining a matter of so much importance to surgery. The frontal *sinuses* have been trepanned with success in *London* and *Paris*.—Perforations
may

may be made lower down the *os frontis* in children, than in adults, without running the hazard of falling upon the *sinuses*, for they gradually enlarge, extending higher up, as they arrive at puberty.—I have applied the trepan near the middle of the *os frontis*, without meeting with any obstacle from the *spinal* process: and at the anterior and inferior angles of the *parietal* bones, without opening the *art. duræ matris*.—The operation has been performed by Mr. *Warner*, upon the *sagittal suture*, when bits of bone stuck in the longitudinal *sinus*, which he easily extracted, after enlarging the wound with his lancet, stopping the *hæmorrhage* with dry lint without any difficulty. Indeed, when we consider the anatomy of the part, there does not appear that risk of opening the *sinus*, purely by the operation, as has been imagined.—I have twice done the operation upon the *occipital* bone, and as often upon the *temporal*, without any ill consequences; though I was under the necessity of cutting away a considerable portion of the *temporal* muscle; and since I published a case of the former, in my Cases and Remarks in Surgery,

I have

I have read two, attended with success, in No. 55, and one in No. 60, of the *Med. Museum*.*

After having deliberately considered every circumstance, and resolved upon the operation, the instruments, sponges, dressings, compresses, bandage, and every necessary thing, are to be disposed in perfectly good order, that the operator may have nothing to seek, when he wants it. The head is to be shaved,

* My very worthy and ingenious friend Mr. Stead, apothecary to Guy's hospital, who lets nothing escape his attention that deserves notice, writes to me thus.

“ Though the lateral *sinuses* are very large, and when
 “ considerably wounded may pour out so large a quantity
 “ of blood as to occasion the death of the patient, yet,
 “ when a fracture demands the application of the trepan
 “ directly upon the ridge of the *occipital* bone, it has
 “ been attended with success; as was the case of a per-
 “ son that a friend of mine trepanned, where a small
 “ splinter of bone was found sticking in the left lateral
 “ *sinus*, which, being gently extracted, only a slight
 “ hæmorrhage ensued, so that he drew off, by this orifice,
 “ what blood he thought necessary. A day or two
 “ after, judging it proper to take away some more blood,
 “ he punctured the *sinus* with a lancet, and stopped the
 “ bleeding both times, with a little dry lint and mode-
 “ rate pressure, with the greatest ease and security.”

shaved, if it has not been already, as indeed it should all over, immediately after any of the preceding accidents, as we have before observed ; it is then to be rested and firmly held upon a person's knees, and with the knife appropriated to this use and the *scalprum*, a piece of the scalp is to be removed, of a circular, elliptical, or other figure, as the circumstances of the case require, The scalping should be of such extent, as may give a fair opportunity of making as many perforations as shall be found necessary, as far as the surgeon's judgment and observation can direct him. He ought not to be sparing in this respect, lest he should be under the disagreeable necessity of extending the incision farther. The manner of cutting is to apply force enough to the knife, to carry it quite through to the bone at once, not bearing too much upon the point, as we have hinted, especially if we cut over loose fragments, which we should endeavour to avoid ; the edge of the knife should be so inclined, as to cut rather more of the *pericranium* than the skin ; when we have proceeded thus far, the *pericranium* is to be raised a little, with the point

point of a knife quite round the incision, and then the *scalprum* used, which will be found the best instrument to clear the bone of that membrane, as I have found by frequent experience. Should it be thought proper to proceed immediately to trepanning, if any considerable vessels have been divided in scalping, they must be secured by needle and ligature; but when we do not intend performing the operation directly, dry lint with compress and bandage, is generally sufficient to restrain the *hæmorrhage*; but sometimes the pressure of an assistant's fingers upon it will serve that purpose, without a ligature, when we determine to proceed to the operation directly.

That kind of trepan, called the *trepbine*, is now in general use, I believe, in all places; it is more commodious than the other, and can be better managed and regulated in the operation, as the different bearings may require; and it will cut full as fast, being worked both backwards and forwards. Before we begin the operation, we must fix the patient's head so, that the light may fall properly upon it, and in such a convenient position,

sition, that the instrument may be placed perpendicularly upon the part, and of such a height and manner, that our attitude may be easy to us during the operation, which often proves tedious, requiring many perforations ; as we may see at large *en Mem. de l' Acad. Roy. de Chirurgie*, tom. 1. *sur la multiplicité de trépan*, par *Mons. Quesnay*.*

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X

Whether

* *Sculetus* says, he was obliged to make seven perforations, in a fracture with great depression. — *Glandorp* says, his master *Spigelius* made the same number upon the like occasion. — *Dionis* made twelve. — *Philip* count of *Nassau* had twenty-seven made in different parts of his head, by *Henry Chadborn*, a very eminent surgeon ; and that nobleman has attested the cure under his own hand. — I made thirteen in the case of an old man, with success, as related in the 2d volume of this work. — I have, within a few years, been concerned in five cases, in which it was found necessary to make four perforations, in one of which there was a collision and separation of the *coronal* suture about one-third of an inch, the whole length of it, with many of the indentations of the bones broken off, and *fissures* extending, in various directions, a great way from thence ; yet the patient recovered, being largely scalped and trepanned in due time, by two very able surgeons, the late Mr. *Cooper* and the present Mr. *Lewis*, of *Bungay* in *Suffolk*.

Whether the patient has the operation performed in bed, or seated in a chair, I have always found, that resting his head on a pillow, with a board underneath it, upon the knees of an assistant, is preferable to any other manner; for being thus placed, the assistant will have more power to keep it steady, to resist the motion of the instrument. These circumstances, how trifling soever they may appear to some, will be found, I am persuaded, of considerable consequence in practice, from what I have often experienced.—When the head is well adjusted, the next step is to make a hole with the perforator, deep enough to fix the central pin of the *trephine*, in order to prevent the saw from slipping out of its circular course, till it has formed a *fulcus* sufficiently deep to be wrought steadily in, and then the pin is to be taken out. If the skull is thick, the teeth of the saw must be brushed clean now and then, during the terebration; and dipping it into oil, as often, will greatly facilitate the motion, and expedite the operation, making it less disagreeable to the patient, if he has his senses; and, in order to
lose

lose no time, it would not be amiss to be provided with two instruments of the same size.—We must remember, after having made some considerable progress in the operation, to observe this good rule, *Festina lentè*, examining the *sulcus* often with a pick-tooth, or some other proper instrument, in order to discover where the bearings are necessary to be made.—These precautions are of more consequence, when we are employed in perforating a part of the skull, that we know has an unequal thickness, especially after having passed the *diploë*; and though we are told by writers in general, that we may saw boldly, till we come at the *diploë*, generally to be known by an appearance of blood, yet we should be upon our guard in this point; examining if the piece be loose, when we have sawn some way into the bone, lest we should happen, through inadvertence, to wound the subjacent membrane; for in some parts of the skull, there is naturally very little *diploë*, and in old subjects, scarce any remains, to afford direction to our judgment, by the bloody appearance: and for the same reason, it is also to be remembered,

that children's skulls are very thin.—When the piece is quite loose, it is to be taken out with the *forceps*, contrived for this purpose ; and if the lower edge of the perforation is left jagged, it is to be smoothed with the *lenticular*, that it may not irritate the *dura mater*.—The next step, is to raise the depressed piece or pieces of the *cranium* with the *elevator*,* or to extract the fragments of the bone, grumous blood, or any extraneous body, with proper instruments. — After this, if there appears good reason to apprehend that blood, lymph, or matter, is contained under the *dura mater*, we should open it directly with a lancet very cautiously, endeavouring to avoid the blood-vessels ramified upon it, and those which lie immediately under it : and, on this occasion, it will be prudential to conceal the instrument, as much as we can, by wrapping it all round with

* Within a few years, the *elevator* has received great improvement, by the addition of *fulcra* to rest upon the sound part of the bone. Mons. *Petit* began the improvement, and it was perfected by Mons. *Louis*.—It is now adopted by our surgeons, and found among the modern sets of instruments for this operation.

with tow almost to the point, in order to prevent impressions being made upon the spectators to our prejudice ; for though the practice is supported by reason, and the authority of the best surgeons, yet nothing but success can effectually secure our reputation against the impertinence of busy people, who judge and determine from events, without considering circumstances.—I have been so fortunate as to succeed twice, evidently saving the patients lives by this means : and lately I assisted a surgeon, deservedly of great character, in trepanning a boy, on account of a very extensive fracture upon the right *parietal* bone, three days after the accident, and we found, upon removing a large portion of the skull, a considerable quantity of a serous fluid collected under the *dura mater*, which, upon pressing with our fingers, bubbled up through several small holes in it, made by its violent detachment from the skull. We agreed upon opening this membrane more than an inch, with a pair of very fine scissars, for the free evacuation of the extravasated fluid ; and the patient recovered, without any threatening symptoms supervening,

vening, and those that attended before the operation, vanished soon after.*

When we have recourse to the trepan, on account of a *fissure*, in which the bone will not yield, we should apply the instrument so as to include part of it, if not directly over it, as it is most likely, the extravasated blood, or lymph, should be found directly underneath it : and when the *fissure* is of great extent, it may be proper to make a perforation at each end, if the whole can be conveniently brought in view ; and, in some cases, more perforations may be requisite, according to the course of it, even to its full extent.

When we propose to make several perforations, in order to remove depressed fragments of the bone, that are firmly fixed, and having the internal surface larger than the external, or to raise them sufficiently, it is necessary to apply the trepan, as near the fractured parts, as they will admit of ; making the perforations adjoining, to save the trouble

* See Vol. II. where, in a case similar to this, the *dura mater* was successfully opened.

trouble of cutting the intermediate spaces with the head-saw : and, as before hinted, we should invariably observe, to make the perforations in the most depending parts we can, for the same reason, as we endeavour to obtain depending openings in the fleshy parts. And in perforating the skull, where there is great inequality of its thickness, it appears more advisable, to raise the piece, before it is cut quite through in every part of it, to obviate injuring the subjacent membrane with the saw.

When the skull has suffered an injury upon a *suture*, and it is not thought advisable to use the trepan there, especially in young subjects, in whom the *dura mater* adheres more strongly than in adults, as has been remarked, we should always remember, to make a perforation on each side of the *suture*, for this obvious reason, because there cannot be a free communication between the one side and the other, on account of the attachment of that membrane to the *suture*.

After the elevation of the fragments of the bone, or the removal of them, the extraction of extraneous bodies, and the eva-

cuation of extravasated blood, lymph, or sanies, &c. the membranes may be dressed with *unguent e gum. elemi*, extolled by *Franciscus Arcæus*, the inventor of it, made of a softer consistence with *bals. e copaib.* or some other natural balsam ; applying it just warm, with a feather, and soft lint lightly over it, dressing the other parts, as we have already directed in wounds of the head : after which, it may be proper to embrocate the whole head with *ol. & acet.* adding a little *spirit. lavend.* and to apply a plaster of *cerat. alb.* or some other such easy application, with gentle compress and bandage. The proper bandages upon this occasion are what the *French* call the *grand couvre-chef*, and the *capeline* or reflex bandage, which require great care and exactness in their application, for the patient's ease. A bandage with six tails, or a kind of coif with lappets affixed to it, may be found very applicable in some cases ; but to serve this purpose, the surgeon must occasionally exercise his invention.

After the dressing, the patient is to be placed in as easy a position in his bed as possible, with his head and shoulders elevated a little

little more than ordinary; and the rules we have laid down in the cure of wounds are to be duly observed.—Warmer applications and bandages are required in winter than in summer.—The degree of heat in the room must be regulated, according to the temperature of the season, and it is necessary to exclude the light.—In injuries of the head, bad symptoms are apt to come on sooner in warm, moist, sultry weather, than in a cold season, when it may be very beneficial to make the circumambient air warm, and dress the wound as expeditiously as possible, defending it from the attack of the cold air.—A strict regimen and observance of the non-naturals are now of the greatest importance to be attended to; for a slight transgression therein may prove of fatal consequence, as we have amply evinced.

When the digestion of the wound proves kind, we shall soon observe granulations of flesh, of a good complexion, shooting from the extremities of the vessels, and throwing off the parts of the *dura mater*, that may have suffered; which, by extending themselves and twisting one with another, form
in

in the aperture, a substance having the appearance of flesh. The same operation of nature, in a longer time, throws off exfoliations from the circumference of the perforation, and other parts of the denudated skull, thicker or thinner, sooner or later, according to the age and constitution of the patient, the degree of injury the substance of the bone has sustained, the season of the year, &c. The granulations which arise from the different parts uniting together, constitute the organized or vascular, carnosus substance, which is called the incarnation of the wound: and this regenerated substance, in young subjects, generally acquires a perfectly boney hardness in the perforation, but seldom in old persons.*

A

* I was desired, some years ago, to see a lad about twelve years of age, who had been trepanned two years before, by a good surgeon, on the left side of the *os frontis*. The wound was healed, but in the very centre of the perforation, I observed a pulsation of small extent. Upon gentle pressure in this boy, the boy complained of a slight degree of pain, then his eyes began to roll about and have uncommon motion, soon after this his sight grew dim, his senses became affected, and his strength

A fungous substance is very apt to fill up the perforation after trepanning, sometimes growing to a considerable size, resembling a mushroom with the stalk in the perforation ; and sometimes the *dura mater* itself is forced through, by the propulsion of the subjacent parts, for want of an equable resistance, to supply the place of the bone. When there is a laceration of the *dura mater*, the *pia mater*, and brain itself, may protrude, as remarked by *Hildanus*, his master *Slotanus*, *Tulpius*, *Schenkius*, &c.

In order to remove these *fungi*, ligature, excision, and escharotics, have been recommended ; and sometimes practised with fatal effects, throwing the nervous system into great disorder.* And as there is so much to
be

strength failed ; and had the pressure been continued, he certainly would have fallen down ; but upon removing it he appeared perfectly well again presently. I repeated the experiment two or three times with the same effect. This case is something like the beggar's at *Paris*, known to almost every body.

* An excellent practitioner, with whom I am particularly acquainted, told me, that upon cutting off one of these *fungi*, his patient was immediately thrown into universal

be apprehended from these methods, we should, by all means, take early care to prevent the growth of such excrescences; which, if neglected, may increase to a great size in a short time; an extraordinary instance of which I observed some years ago, in an hospital in *London*, upon the examination of a young woman's head, who died about ten days after having been trepanned in three different places, on account of a concussion of the brain. Through each perforation, a fungosity was grown considerably above, and spread upon, the surface of the bone, resembling what I have described. Extravasations were also found, from ruptured vessels in the plicatures of the *pia mater*, with a large quantity of a lymphatic fluid in the ventricles of the brain.

I have found, by repeated trials, that *Belloste's* method will effectually answer the important

versal spasms, which made him fear the loss of his life would have been the consequence of it. Since this alarming appearance he has always followed the preventive method I am about recommending, without observing any manner of inconvenience arising from the use of it, as did I ever myself.

portant end of preventing the growth of these excrescences, when the *dura mater* is not lacerated. And once I experienced great advantage from it in a case where it was lacerated ; under which circumstance, perhaps it may be of more signal service. The perforated plate of lead, invented for this purpose, is described by a figure in *Belloste's* Hospital Surgeon, and in *Heister's* System of Surgery, pl. 15. fig. 14. 15. More than thirty years ago, before I had read that useful book, I made and used it myself, for the same obvious reason, that put him upon the invention, and which at the very first succeeded to my wish. It is easily made, after being exactly marked out with the crown of the trepan.*

The best method of using this plate, that I have been able to discover from my experience, is first to apply to the *dura mater* a *findon*, spread with the balsam recommended, or dipped into it moderately warm, according to the state the membrane appears in ;
then

* See note annexed to 4th case of a fracture of the skull, in Vol. II.

then the plate is to be exactly adjusted in the perforation upon the *sindon*, having the ears of it turned back upon the skull ; over which, a compress, consisting of a few doubles of common plaster, with a piece of very thin sheet-lead or card interposed, is to be laid ; filling the wound up with even lint, rather above the level of the scalp ; then a small, easy compress of cloth, faced with *cerat. alb.* is to be applied, with a piece of card or thin stiff paper on the outside of it ; over which, strips of common plaster, about an inch broad, are to be laid crucially, extending two or three inches beyond the compress. By this means, the plate will be properly confined, and the degree of pressure may be easily regulated, without inconvenience to the patient, or interrupting the discharge at the wound ; and should a greater degree of pressure be required, it may be obtained, by thickening the compress, and making one of the slips of plaster pass through a slit in the other, as in the uniting bandage. After proceeding thus far, the head is to be embrocated, and a large thin compress, spread with *cerate*, applied
over

over the crucial plasters, with easy bandage, as before directed. When the *dura mater* is granulated with flesh, the *findon*, or lint, moistened with a mixture of *tinct. myrrhæ* and *aq. calcis*, is a good application; and the other parts of the wound are also to be attended to, according to the rule of surgery which we have before laid down, in order to prevent the luxuriance of flesh, till the exfoliations are completed; for should this point be neglected, and loose flesh suffered to creep upon the bone, from the circumference of the wound, much inconvenience and trouble, besides pain to the patient, might proceed from such inattention, as I have seen very lately.

Though from what I have observed, fungosities are more to be guarded against after single perforations in trepanning, yet in a great loss of substance of the skull, a perforated plate of lead well adapted to the space, having its edges carefully conveyed a little way between the skull and the *dura mater*, this being first dressed as directed, may prove very useful, as has been experienced

rienced by other furgeons as well as myself. Besides the good effect it may produce in supplying the natural pressure of the bone for a due time, it will give more room for the evacuation of any fluid that may be there contained, and also defend that membrane against the asperities of the bone.

By these measures, I have always been able to obviate the inconveniences, arising from fungous excrescences, in consequence of trepanning, &c.

An abatement of the symptoms after the operation, with a good aspect of the wound, in a healthy subject, give us reason to hope for success; but if the symptoms continue threatening, with a dryness, glassy appearance, or livid colour, of the wound, or a discharge of a fetid gleet from the membranes or brain, they are to be looked upon as very bad omens: however, we are not to omit the use of all rational means, having instances enough, upon record, of the happy event of the most alarming cases to encourage our perseverance.—The symptoms, after the operation, may require frequent

quent bleeding, as well as a strict regimen, and observance of the non-naturals, as has been particularly exemplified in the gentleman's case, which I have mentioned, who was trepanned on the *temporal* bone.

It is surprising sometimes to see the very sudden good effects of the operation, as in the clergyman's case I have related.—— Professor *Monro* says, he saw a soldier trepanned on account of a fracture, with depression of his skull, when he was quite stupid, and who almost perfectly recovered his senses, half an hour after the operation ; his face and eyes too, which were prodigiously swelled before, became visibly less in a short time.

Should the patient, at any time after the cure, complain of pain or disorder in his head, with symptoms of plenitude, recourse ought to be had immediately to bleeding and gentle purging, with the observance of a spare diet : and for some time after his cure, he should always be very exact in his regimen and government of himself, both as to body and mind ; and it will be very prudent

to wear, for some considerable time, a thin brass, steel, or tin plate, to defend the part against external injuries, especially if there has been any great loss of the bone : under which circumstance, in old persons, such a defence may be found necessary for life.*

O F

* These eminent writers may be occasionally consulted upon this subject. *Hippocrates, Berengarius, Hildanus, Fallopius, Magatus, Scultetus, Fienus, Tulpus, Schenkius, Bobnius, Glandorpius, Paré, Marchetti, Wiseman, Bellosse, Van Swieten, &c.* and more particularly *Monf. Quesnay's* Dissertations, in *Mem. de l'Acad. Roy. de Chirurgie*, tom. 1.—*Mr. Pott's* judicious treatise upon this subject should by no means be forgotten : and in the second volume of this work, there are some extraordinary cases.

OF TUMOURS ON THE HEADS OF NEW-BORN CHILDREN.

AS we have no description of these tumours, that can be relied on, in any writer that I have seen, I here subjoin a short account of the nature, and proper method of treating them, to assist the judgment and practice of the unexperienced.

This kind of tumour proceeds from an extravasation of blood; probably, in consequence of some injury in a laborious, hasty, or injudicious delivery; as time should always be allowed for a gradual dilatation of the parts, to admit of the exclusion of the foetus with safety. It is seldom observed on any other parts of the head, than the *parietal* bones; and the extravasated blood is more frequently lodged between the *pericranium* and the *cranium*.

This tumour is generally circumscribed by a ridge, when the extravasated fluid is contained between the *cranium* and *pericranium*, and feels as if there was a depression or de-

ficiency of the bone ; but the deception is owing to the fluid in the distended *pericranium* yielding to the fingers, and to the ridge circumscribing the tumour, which may be taken for the edge of the bone, without very accurate examination.

Some surgeons have looked upon this sort of tumour as an *aneurysm*, proceeding from the inside of the skull ; others as a *hernia* of the brain ; but was either of these the case in question, it must appear between, and not upon, the bones, as it does ; and, according to the first supposition, a pulsation would be observed in it. That eminent practitioner, *Monf. Le Dran*, one of the best and most accurate of the *French* writers, had very confused ideas of this kind of tumour, as we may see in his first observation.*

The surgeons of the Foundling Hospital, who have had the greatest opportunities of discovering the nature of these tumours, and the best method of cure, from their large experience,

* *Sur la tumeur à la tête d'un enfant nouveau né.*——
Monf. Leveret slightly mentions this kind of tumour in
l'Art des Accouchemens.

experience, say, they generally succeed by opening them, in case the children are otherwise healthy; and that they prefer this method, rather than waiting in expectation of absorption by any other, apprehending that the bad consequences they have seen may proceed from the putrid quality of the fluid, contracted by its stagnation. They make an incision the whole length of the tumour, lay soft dry lint under the edges of the wound, to favour the discharge of the extravasated blood, after pressing out as much as they can without bruising the tender parts, and then apply a pledget of common digestive over the lint, with easy compress and bandage. By this treatment, those gentlemen have assured me, that they very seldom meet with any trouble in the cure, to discourage the practice; but when the blood lies next the bone, very thin scales will sometimes rise and retard the cure a little.*

Y 3

Some

* I visited that hospital with my friend Mr. *Tomkyns*, on purpose to get the best information I could in this matter; and at a house that is an appendage to it, appropriated for the reception of children as soon as they are

Some other practitioners, of experience too, whom I have talked with upon this subject, are against opening these tumours ; advising the application of compresses, moistened in warm austere red wine and vinegar, to be renewed as often as they grow dry, and say they have generally observed absorption of the fluid to be the effect of this method, without bad consequences : however, should there appear no diminution of the tumour, by regularly pursuing this method a reasonable time, it will then certainly be advisable to open it, lest the fluid should be absorbed in a putrid state, or the bone injured by it, whence bad consequences might ensue : and if the bone received an injury originally, the necessity of opening it is indisputable.*

I have

are born, I saw some of these tumours opened, some under cure, and many that had been cured by opening : and according to the hospital admission-book, which I examined for some years back, I observed that scarce a week passed, without a case of this kind having been admitted.

* I have in my possession a *parietal* bone, that was fissured in a case of this nature, with the *pericranium* annexed to it ; showing the extravasation was between that
and

I have succeeded in some cases by both methods, attending to these circumstances and considerations, to direct my judgment and practice.—I have generally added *sal. ammon. crud.* to the above mentioned applications.

Y 4

OF

and the bone, in which the circular ridge I have mentioned, evidently appears.

This bone is represented in the plate facing p. 337, fig. 1.

A. A. A. A. The elliptical ridge formed by the increased thickness of the pericranium over the right parietal bone, which was the boundary of the tumour; and under that membrane the extravasated blood was contained.

B. B. A portion of the scalp removed perpendicularly as far as the ridge, showing the fissure
C.

OF WOUNDS OF THE FOREHEAD, FACE, AND
ITS PARTS; NECK AND ITS PARTS, AND
THE TONGUE.

INCISED wounds of the forehead and face require nothing peculiar in their management. The lips of them are to be kept as much in proximity as possible by the dry future, as has been described, to prevent deformity of the *cicatrix*. And in lacerated or contused wounds of these parts, the general rules that have been prescribed in such cases, are to be observed: but when either of the *salival ducts* * is totally divided, in a wound of the cheek, or even when partially divided, and cannot be closed up by the generation of flesh, there will consequently be a great effusion of *saliva* eternally; and the course of this watery fluid must be diverted, by making a perforation into the mouth with some proper instrument, drawing a seton through, continuing it a due time, and then endeavouring

* The superior *salival duct* is called *ductus Stenonis*, and the inferior, *ductus Whartoni*.

avouring to heal the external aperture.—
 Professor *Monro* recommends this method;
 and I have practised it with success to my
 wish.*

Sometimes in wounds of the glandular parts hereabouts, *lymphatics* are also divided, discharging a great quantity of such a kind of fluid; but it is not so difficult to restrain this effusion, as that proceeding from the division of the *salival ducts*. Lint moistened in *alcohol. vin.* or a solution of *sacch. saturn.* in *aq. calc.* & *alcohol. vini p. æ*, applied and assisted with a proper degree of pressure, and dressing seldom, will generally answer the purpose, as I have experienced in several instances; particularly in two, where the discharge was very profuse, from wounds of the *parotid* glands. This treatment may be first tried, when the *salival ducts* are opened, before making the perforation into the mouth, taking particular care in respect to the compression; a case of which kind, that succeeded, is mentioned in Vol. II.

Wounds

* See Med. Essays, vol. 2. ess. 13. See also *Monf. de Roy's* method, in *Saviard's* observations.

Wounds of the lips, when totally divided, must be stitched as described for the hair-lip, pag. 149 ; otherwise the skin will draw over each lip of the wound separately, and prevent the reunion. The same will happen in wounds quite through the wings of the nose, ear, or eye-lids ; but the latter require very nice and tender management, from the exquisite sensibility of the parts ; on which account, besides the general method here laid down as to the treatment of the wound itself, we must particularly attend to the prevention or removal of pain, inflammation, &c. by bleeding, laxatives, and a proper regimen, as well as by anodyne, emollient, and refrigerating topics ; as a fomentation prepared with poppy-heads ; emollient herbs, &c. boiled in water, with the addition of milk, and a white-bread poultice ; and, before the application of the latter, a plaster of a cooling *cerate* should be applied, dressing the wound with some mild balsamic medicine. *Emuls commun.* & *julep. e camphora p. æ.* make a good *collyrium*, to be used in washing purulent matter or other foulness out of the eyes, in a tender and inflamed state.

state. This general method may also be followed in a wound of the eye itself ; which is very apt to inflame, and be attended with a great degree of pain, extending into the head, and sometimes exciting a violent fever, delirium, &c. therefore the utmost attention is to be paid to wounds of this part at first, in order to obviate bad consequences.*

——It

* It being now generally believed that the patient is more liable to bad accidents in consequence of extracting the *crystalline*, than in depressing it in the *cataract*, *Daviel's* method loses credit with many of the most eminent of the profession ; and in several instances I have observed such bad consequences, as could not have happened by depression, particularly in one case, though the celebrated *Wenzel* was the operator.——*Monf. Daviel* has had the honour of this discovery ascribed to him, but the same operation was practised sixty years ago by *Monf. St. Ives*, and then by *Mery* and *Petit*, when the *crystalline lens* was become differently diseased, and had passed through the pupil into the anterior chamber of the eye ; in which case depressing of it is impracticable : and probably it will be found most advisable to confine this operation of extracting it to the disease thus circumstanced.

See *St. Ives des Maladies des Yeux*, chap. xxi. and what *Mr. Pott* says, in respect to *cataracts*, in his *Chirurgical Operations*, lately republished with the rest of his works.

—It is worth considering, with what kind of weapon, and in what direction of it, the wound was inflicted ; for through the orbit it might easily penetrate even to the brain, of which we have an instance in *Ruyfch*.—

Some time ago, I was desired to visit a person in *extremis*, four days after receiving a wound of this nature by a cow's horn. And lately, a surgeon asked me to visit a patient with him, who five days before had a piece of wood forced into the orbit of one of his eyes, penetrating quite to the brain, whence direful symptoms ensued : and that day the convulsive contraction, called the locked-jaw, came on ; soon after which he died.

The neck is a very dangerous part to receive a wound in, on account of the large blood-vessels, the *trachea*, the *œsophagus*, *spinal* marrow, and recurrent nerves, which have a great influence upon the voice.—

When a *carotid* artery is opened, we must use our utmost endeavours to pass a ligature about it, above and below the opening, and if that cannot by any means be effected, try other expedients, as mentioned in pag. 102.

—If the internal *jugular* vein happens to
be

be wounded, and it can easily be come at, a ligature is advisable above the aperture; or a *styptic*, or some fungous substance with good compression, may answer the end.—In the second volume of the *Mem. of the Royal Academy of Surgery*, there is an ingenious and well adapted compressive machine for this purpose.—When the *hæmorrhage* is stopped, the wound is to be dressed as has been directed.

When the *trachea* or *œsophagus* has received a large wound, the interrupted or twisted *suture* is necessary; and in some cases, strips of adhesive plaster may be found useful, either with or without the *suture*. The latter of these parts is very difficult to come at, from its situation behind the *trachea*: and if either should be totally divided, little is to be expected from art.*

These wounds are to be treated in the common manner, with agglutinating, balsamic applications and easy bandage, observing

* See *Essai sur Oesophagotomie*, par Mons. Guattani, et *Mem. de l'Acad. Roy. de Chirurgie*, tom. 3.

ing an exact regimen. The patient should be strictly enjoined to live upon a soft, balsamic diet, of such consistence, as may easily slip down, with as little of the action of deglutition as possible. His body should be kept open with the frequent repetition of clysters, lest any kind of purging medicine, taken by the mouth, should offend the stomach and excite vomiting, which might affect the wounded parts, and prove of fatal consequence.—When deglutition is wholly obstructed, without a total division of the parts, we have good authorities to endeavour to support the patient, and prevent his starving, by nutritive clysters, till the cause of the obstruction can be removed; as *Oribasius*, *Ætius*, *Tulpius*, *Bartholinus*, &c. have recommended.

Benedictus Bonacursius says he cured a person, who cut his own throat in prison, making a large wound in the *trachea* and *œsophagus*, which was deemed incurable.

Bodinus, in *Theatro Naturæ*, says, that *William* prince of *Orange*, having received a wound in his throat upon the *larynx*,
lost

lost the sense of tasting; and that a *French* foldier, from such an accident, became mute.*

AN HISTORY OF A SINGULAR CASE, AND OF A
VERY SINGULAR NATURE.

I HAVE lately had the opportunity of examining with a physician and a surgeon, the parts which suffered by an *hypochondriac*, who cut his throat with a razor. The wound extended almost from ear to ear, but neither of the *carotid arteries*, or *internal jugular veins* was opened. The parts were divided into the *pharynx*, precisely level with the *thyroid cartilage*, in such a manner, that in the act of deglutition, every kind of aliment, in its progress towards the *pharynx*, bore down the *epiglottis*, letting most part of it pass through the wound, some falling into the *trachea* by the *glottis*, exciting a violent, convulsive, suffocating cough; but little or
none

* See *Mem. par Mons. Verdier, en Mem. de l'Acad. Roy. de Chirurg.* tom. 3. *sur une playe à la gorge, avec des remarques intéressantes à ce sujet.*

none arrived at the *pharynx* to descend the *œsophagus* ; yet he lived fourteen days, having nutritive clysters frequently given.

In order to have demonstrative ideas, of the wound under consideration, take a sufficient portion of the *trachea* and *œsophagus* of a sheep or calf, together with the *larynx* (which is the superior part or head of the *trachea*, consisting of the *epiglottis*, the *thyroid*, two *arytenoid* and *cricoid cartilages*) the *pharynx*, *os hyoides*, and *tongue* : then make a semilunar wound, at the very edge of the *thyroid cartilage* into the *pharynx* : suspend these parts by the *os hyoides*, and let the wound have its full *hiatus*, by hanging a weight at its lower and anterior part ; then pass your finger in the course of the aliment in deglutition, and you will find it propels the *epiglottis* into the wound, by the slightest touch imaginable.



Fig. 2.

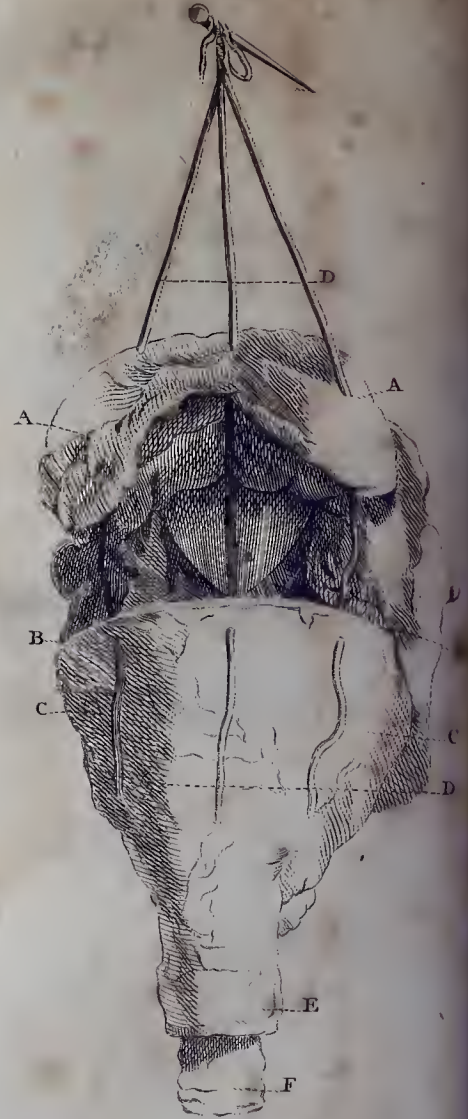


Fig. 1.



Explanation of Fig. 2, in the Plate 4, annexed.

- A. A. The os hyoides, drawn up by the action of the muscles.
 B. B. The course of the wound.
 C. C. The thyroid cartilage.
 D. D. The ligatures, including the os hyoides, and passing through the edge of the thyroid cartilage, &c. with that in the middle over the epiglottis *a*.
 E. The trachea.
 F. The œsophagus.

* * Both the engravings in this plate were accurately made from the parts, which I have in my possession.

In this case, the *epiglottis* being drawn out of its natural position, into a very inclined plane, by the flying up of the *os hyoides*, upon the division of the muscles, attached to its *basis*; and the *epiglottis* having lost its support, the smallest weight of aliment necessarily made it yield immediately: and even when the inclination of its plane was in some measure lessened, by bringing the head for-

wards, and by the interrupted *future*, which was made in the teguments, soon after this fatal accident happened, yet that obstruction to the cure was not remedied.

In this state the parts remained eight days, then the stitches were taken out ; and the true nature and condition of the wound evidently appearing, a stitch was made from the inferior part of the *os hyoides*, brought down by the dissecting hook, to the superior part of the *thyroid cartilage* ; but the cough still continuing, in consequence of attempting to swallow any food, and also at other times, by the irritation of matter falling upon the same parts, the stitch was soon broken out, rendering this rational step entirely fruitless : had it been practised at first, and the patient nourished wholly by clysters, in order to have prevented the cough for some days, perhaps it might have succeeded.*

Had

* In a case of this kind, the clysters should be given in small quantities, and injected as far up as possible, by the syringe appropriated to this use.—The mouth may be kept moist, by frequently holding a small quantity of some smooth, pleasant thing in it, without attempting to swallow ; which may be taken up by the absorbing vessels.—

Had the true nature of the wound been at first discovered, and could a proper number of stitches have been made, with very strong, well-waxed, flat ligatures, encompassing the *os hyoides*, and passing through the *thyroid cartilage*, a few lines below its edge, including the teguments, and studiously endeavouring to avoid the *epiglottis*, tying the ligatures with slipping knots, for obvious reasons, this seems to us the most probable method to have answered the end : or, could only one ligature have been passed, in this manner, by a needle more than ordinarily curved, with the assistance of the *port d'aiguille*, or by a haisted needle, having an eye near the point, round the *basis* of the *bone*, after drawing it down with a strong dissecting hook, perhaps that might have given an opportunity of other stitches taking place on each side of it, by passing through the teguments and edge of the *thyroid cartilage* ; if found absolutely impracticable to convey one

Z 2

on

sels.—Rest and quiet should be most strictly enjoined ; and, to procure sleep, *tinct. theb.* may be occasionally given in the clysters, at discretion.

on each side about the bone, at a little distance from its *basis*.* and it may be worth considering, how far pursuing the *bone* with a longitudinal incision, might facilitate the passing a ligature round its *basis*.—Here, indeed, lie difficulties that may prove insuperable ; yet, as it is a matter of the last importance, we cannot forbear recommending every rational attempt which occurs to us, to the consideration of our brethren ; and not knowing we have a similar case to it, in the records of surgery, though, considering the circumstances, it is not improbable to have often happened and passed unnoticed ; this consideration is a farther encouragement to our offering these hints.

When a person is so unhappy as to attempt suicide, in this manner, and happens to wound

* Strips of sticking-plaster may be found useful in aid of the stitches, by passing from the hinder part of the neck, and crucially over the wound, bringing the head forwards, and keeping it in that position by a bandage properly adapted to this purpose, at the discretion of the surgeon, who should lay the strongest injunction upon the patient and his attendants, for the observance of this necessary precaution, in respect to the inclination of the head.

wound both *trachea* and *æfophagus* at the same time, it must generally be below the *thyroid cartilage*, that, in adults, being almost as hard as bone, the solidity of it increasing with age : besides, from the loose attachment of this *cartilage* to the adjacent parts, it readily gives way, abating the force of the stroke ; still they may suffer at once, by the cut of a broad sword, or the thrust of a sharp-pointed weapon.

In the space of a year, a farmer's servant came to me twice with a pin and once with a needle sticking in the *æfophagus*. The needle and one of the pins I extracted with a pair of *forceps*, properly curved to serve that purpose ; the other lying out of the reach of the *forceps*, I ventured to attempt to thrust down with a whalebone, having a piece of sponge tied securely to the end of it, and happily succeeded. The year following, when she lived at a greater distance from me, not being sufficiently admonished, by the dangers she had escaped, against the foolish custom of putting pins or needles into her mouth, another needle slipped into the *æfophagus*, where it was fixed, and could not

removed by art ; but in length of time, after causing a violent and most dangerous inflammation, it made its own way by an *abscess* externally, which was soon cured. This narrow escape effectually cured her inadvertence.*

Wounds in any part of the *spinal-marrow*, require no peculiar treatment, though they are always attended with alarming symptoms, from its being an appendage of the brain ; and the parts that receive nerves from thence will suffer a *paralysis*, and sometimes mortify ; instances of both which dreadful consequences I have seen in injuries of this part.†

When the *recurrent* nerves are divided, little is to be feared on that account, more than having the voice or speech affected, in case no other material part of the neck has

* See observations *sur les corps éstranges arrêtes dans l'œsophage*, &c. en *Mem. de l'Acad. Roy. de Chirurgie* par *Monf. Hevin* ; and what doctor *Tiffot* says upon this subject, in his *Avis au Peuple*.

† Vid. *Comment. Van Swiet. in Aphoris. Boerhaavii*, § 162, concerning the effect of injuries of the *spinal marrow*.

has suffered ; nor do these wounds require any particular management.

The tongue is of great use, not only in forming and modulating the voice, but in tasting and masticating our food, and in deglutition ;* therefore large transverse wounds of this organ demand particular consideration and attention. In these cases stitching is recommended by surgeons in general ; but as the tongue is of a very soft, loose texture, the success of it is precarious, as well as the operation difficult to perform : however, should it be thought most advisable to attempt it, the tongue, when sufficiently drawn out of the mouth, must be firmly held with

Z 4

a piece

* I have seen and examined the mouth of a woman, at *Wickham* in *Suffolk*, who lost all, but a very small portion of her tongue, when she was a child, by a *phagedænic* ulcer, yet she speaks very articulately, and swallows her food without difficulty.—*Riolanus*, in his *Anthropographia* mentions a child of five years old, who lost his tongue in the small-pox, but not the *uvula*, and spoke almost as distinctly as before.—And *Monf. Jussieu* has recorded in the *Mém. de l'Acad. Roy. des Sciences*, a wonderful case of a girl, who could speak very articulately though she was born without a tongue, and had only a tubercle or small carnosus substance in its room.

a piece of cloth by an assistant, whilst the operator passes the needle and ligature deep in its substance, or rather quite through it, making as many stitches as he finds necessary : after which, it will be proper to hold medicines, almost continually, in the mouth, of a subastringent and vulnerary nature, which alone may be sufficient to heal small wounds of this part : and indeed *Hildanus* says, he cured a girl of a very large transverse wound of the tongue, without stitching, by a gargarysm of this kind, sweetened with *syrup. e rosis siccis* ; ordering her to hold frequently in her mouth some of the same syrup, or that of *quinces*. The patient should live upon a soft liquid diet, not requiring mastication, and have his body kept duly open with laxatives.*

OF

* See what *Monf. Pibrac* says in his dissertation upon the abuse of *futures*, in wounds in general, and upon this in particular, in the 3d vol. of the *Memoirs of the Royal Academy of Surgery*.

OF WOUNDS OF THE THORAX, AND ITS
CONTENTS.

THE cavity of the *thorax* is circumscribed by the *sternum*, the twelve *vertebræ* of the back, the *ribs*, the *clavicles*, the *intercostal muscles*, and the *diaphragm*, which part divides it from the cavity of the *abdomen*, and is situated in an oblique direction, considerably lower posteriorly than anteriorly ; consequently the *thorax* is more capacious behind than before : and the whole cavity is lined with the *pleura*, which is a reflected membrane, making two complete bags, in which are contained the two lobes of the lungs, lying in the two lateral cavities of the *thorax* ; and these two bags, united by *cellular* membrane, form the *mediastinum*, which is connected to the *sternum*, dividing the *thorax* into two parts. There is also a posterior *mediastinum*, which adheres to the *spine*, where runs the *æsophagus* and *aorta*. These *septa* prevent a communication of fluids between the cavities. The *thorax* contains the
lungs,

lungs, the heart in its bag called *pericardium*, part of the *œsophagus* and *trachea*, and the *thoracic duct*, or canal running from the *receptaculum chyli*, as will be described.*

Wounds of the *thorax* may properly be divided into three sorts. 1. Those of the teguments and muscles, or containing parts. 2. Those which penetrate the cavity without hurting its contents. 3. Those in which the contained parts also suffer ; of all which we shall treat in order.

The wounds of the first class are known by inspection, by searching with the finger, probe, or bougie, by observing no air discharged from them, by the immediate return of a proper injection ; as barley-water and honey, or some such soft inoffensive liquor : and should the wound penetrate, what remains of the injection in the cavity, may be absorbed by the bibulous vessels, opening upon the surface of the parts, without doing any injury.

In

* The *receptaculum chyli* and *ductus thoracicus* were discovered by Pecquet, and by him demonstrated at *Paris* in 1651 or 1652.

In all these trials, in order to discover the penetration of the wound, we must not forget, to place the patient in the same posture he was, when he received it ; for otherwise, a piece of *cellular* membrane, or other substance, may fall in the way, obstruct the passage, and frustrate our examination.

We have not much reason to fear a disappointment, in the cure of incised wounds upon the teguments, &c. of this part ; though the continual and necessary motion of the *thorax*, in respiration, may a little retard the cure ; and on account of this motion, stitching a wound on this part is not advisable ; as the stitches might soon break out, leaving the wound in a worse condition, as we have remarked before ; but the *dry-future*, or strips of common plaster, properly applied, may be of use, by preventing in some measure, a recession of the lips of the wound.

In case a wound is made by an oblique thrust of a weapon, and penetrates deep, without entering the cavity of the *thorax*, we are by no means to obstruct the egress of the matter, by cramming into the orifice
tents

tents or hard doffils ; but on the contrary, we are to promote it, by removing all impediments, by enlarging the aperture, if it is too small, and by endeavouring to gain a depending opening ; but when this important point cannot be obtained, we must use expulsive compresses, and an easy well adapted bandage, after dressing the wound with a soft vulnerary balsam, &c. assisting such measures all we possibly can, by a favourable position of the body, that a collection of matter may be prevented ; which, when lodged near the *pleura*, may easily erode it, and discharge itself into the cavity, causing an *empyema*.

The general rules in the treatment of wounds, are to be observed in these cases. *Belloste* and *Magatus* plainly show the pernicious effects of tents ; and have established a rational practice from experience, in the management of wounds, now universally approved : though, in some particular circumstances, a tent may have its use, as we shall show, especially when made hollow.*

In

* Though *Belloste* has done good service to surgery, exploding the use of tents in general ; yet, in his
Hospital-

In order to discover, whether a wound penetrates the cavity of the *thorax*, we are,

1. To consider the kind of instrument, the figure of it, and its direction, when the wound was given, with the posture the body was then in, comparing the size of the external part of the wound with the weapon, how far it is bloody, &c.
2. We are to search with the finger, probe, or bougie, as has been directed; remembering to place the patient in the position he was, when he received the wound; otherwise the obstacles before mentioned, or a change of situation of the muscles, may obstruct the introduction of any instrument used in the exploration of the wound, and not admit the entrance of the injection.
3. We are to observe, whether air comes out of the orifice forcibly enough to move the flame of a candle held to it, upon the patient's inspiring as much as he is able, and making as strong an effort in expiration. This experiment indisputably
proves

Hospital-Surgeon, he seems to have run into the other extreme, in the superficial dressing of *abscesses* at the first opening.

proves the penetration of the wound, should the flame of the candle be moved, under which circumstance, the air will sometimes move through the aperture, causing a noise in the cavity, and more so, when the lungs are wounded in an adhesion of them to the *pleura*; in which case, an injection would excite a cough, and might be conveyed by the *trachea* into the mouth. When the air is obstructed, and cannot find a passage out, it may insinuate itself into the *cellular* membrane, puffing that up to a great degree; though this *emphysematous* swelling is more likely to proceed from an internal wound by a fractured rib; of which there are several instances upon record; but none so very extraordinary as that related by doctor *Hunter*, which he favoured me with a narrative of, before it was published; and under his direction the patient was saved, by incisions in various parts, bandage, &c. as appears in the 2d vol. of the *London Medical Observations and Inquiries*; which astonishing case should by all means be attentively read.

When we have ascertained the penetration of the wound into the cavity of the *thorax*,
there

there is reason to fear the contents of it may be injured ; therefore at first, the *prognosis* must be doubtful ; but should no symptoms appear of any of the contained parts being wounded, or blood or air contained in the cavity, we are to treat the wound according to the general rules, but dressing seldom or than common is advisable in this case.—

When we have any indication, that air has entered the cavity through the wound, we must first attempt the expulsion of it ; for a small quantity, by rarefaction, may compress the lungs, and obstruct their expansion ; causing great difficulty in respiration, and interruption to the circulation of the blood, which symptoms may deceive us in our judgment, without particular attention, and make us apprehensive there is blood to be evacuated ; and conclude, from this consideration, that it is proper to keep the wound open ; as *Muys* ingenuously confesses he did, and kept his patient some weeks under his care, when he might have cured him in a few days, had he been well acquainted with the
cause

cause of the symptoms.*——The method recommended for expelling the air out of the *thorax* is, to make the patient inspire, as much as he possibly can, keeping the wound close covered ; then to uncover it immediately after this full inspiration, desiring him instantly to make a powerful effort, as in expulsion of the *feces*. By this means, the included air may be driven out of the orifice, unless change of position of a muscle, or some other obstacle shuts up the passage. This process is to be repeated, as often as shall be found necessary, to clear the cavity of the air that had found admission through the wound ; whence the propriety of dressing but seldom, and other requisite precautions, to exclude the air at the time of dressing, in a case thus circumstanced, are obvious.——*Boerhaave*, by this method, cured an *English* gentleman in a short time, under such circumstances, when his life was despaired of.

In

* See a case in Vol. III. in some measure applicable to this purpose, where, in a pulmonic disease, air was contained in the cavity of the *thorax*.

In a penetrating wound, though the *viscera* of the *thorax* are unhurt, yet vessels may be divided, and pour blood into the cavity; therefore great attention is to be paid to the resemblance of symptoms, in order to determine the true cause from whence they proceed; as the operation, essentially necessary, when blood is there confined, might prove of fatal consequence to the patient in the contrary case, by the admission of more air.

The principal sign of blood being contained in the cavity of the *thorax*, is a difficulty of breathing; but the difficulty is least when the patient is in an erect posture, because then the lungs have most space for expansion: the easiest posture next to this, is lying on his back: it is very uneasy for him to lie on the wounded side, and he cannot bear to lie on the sound side, the weight of the fluid resting upon the heart, lungs, and *mediastinum*; and if blood is lodged on both sides, he can lie on neither, but on his back only, with any tolerable ease; and in an erect posture, he is often sensible of a weight upon

the *diaphragm*, with some fluctuating motion of a fluid.

Respiration and the circulation of the blood will be greatly affected by this cause, and the extravasated fluid being agitated and heated, soon acquires a state of putrefaction, and may then erode and corrupt the *pleura*, lungs, *mediastinum*, *diaphragm*, and *pericardium*, and heart itself; therefore we are to endeavour to evacuate it, as soon as possible, in order to prevent such dreadful consequences; or what may proceed from an absorption of such a putrid fluid into the mass of blood.—We must not trust to medicines alone for the cure, as *Massa* proposes; nor to nature's performing it, as mentioned by others, though many instances are to be met with in observers to this purpose.—Professor *Monro* speaks of a gentleman, who was wounded in a duel, and had the symptoms of blood lodged in the *thorax*; which vanished, upon the evacuation of a considerable quantity of bloody matter with his urine.—*Swammerdam* relates a similar case, in which the patient voided blood with his urine, and

was

was cured.—*Fabricius ab Aquapendente* mentions such a case, in which the surgeons had resolved upon opening the *thorax*; but at that juncture, the patient voided a large quantity of blood by the urinary passages, which discharge removed all his complaints.—*Glandorpius* speaks of such a case.—*Nicolaus Novocomensis* gives a narrative upon the case of his friend, who was cured by a bloody evacuation by stool, in a penetrating wound of the *thorax*.

Notwithstanding the instances which show, that nature unassisted sometimes performs cures by extraordinary ways and means, it is incumbent upon us, to use all the rational methods of assistance, that our art teaches, in these threatening cases, in order to obviate the destruction of the vital parts, by the confinement of a putrid fluid; or that which will soon become so.

When the wound is situated in the lower part of the *thorax*, the patient is to be placed in such a position, as makes it most depending, to facilitate the evacuation of the fluid; and when obstructed by the lungs, we must press them back with some proper flat instru-

ment, by which means, if the blood or matter is thin it will run, or be in a manner pumped out, by the action of the lungs in respiration ; but if the orifice is small, we must enlarge it ; and should the blood be coagulated, it will be proper to inject some resolvent liquor, as warm barley-water, or pectoral decoction, with honey, to render it fluid and fit to be evacuated. When it does not pass off readily by these means, some authors recommend the use of a syringe, to absorb it by suction ; but this method is not much to be relied on.—*Dionis*, in his operations of surgery, mentions the case of one of the duke of *Burgundy's Gendarmes*, who had received a thrust with a sword under his right breast, to whom he was called soon after the accident, and dilated the wound sufficiently to evacuate the extravasated blood without introducing any thing into it. He obliged the patient to lie constantly upon it till the next day, when he found the cavity of the *thorax* perfectly emptied of the blood, and the *hæmorrhage* stopped ; after which, the patient was cured by superficial dressing,

dreſſing, and returned to do duty in the army.*

I was lately deſired by Mr. *Talbot*, a ſurgeon of character at *Wymondham*, to viſit a boy with him, about thirteen years of age, who, three days before, fell from the top of a barn, upon a ſharp plough-coulter, which made an oblique wound, cutting through ſome of the ribs; beginning near the *axilla*, and ending at the bottom of the *ſternum*, juſt above the inſertion of the *diaphragm*. By this horrible wound the left cavity of the *thorax* was wholly expoſed to view, ſhowing that lobe of the lungs, the *diaphragm*, and the heart in the *pericardium*, all in motion. I viſited him a ſecond time, ſeven days after, and again viewed theſe parts with aſtoniſhment, conſidering all the circumſtances: now the whole lobe of the lungs appeared in a mortified ſtate, without any air entering it, at leaſt we could not diſcover any degree of inflation, and the motion of the heart and

A a 3 *diaphragm*

* See *Belloſte* and *Le Dran* concerning penetrating wounds of the *thorax*; and *Lanfranc*, *Guido*, *Paré*, *Fab. ab Aquapendente*, *Horſtius*, and other obſervators.

diaphragm was very languid ; but still he lived two days longer, which made twelve after the accident, and then ended a miserable life, in the most agonizing death, having his senses to the last moment.

When the wound is in the superior part of the *thorax*, and the blood has fallen upon the *diaphragm*, which may be depressed by the weight of it, there is no possibility of its being evacuated by the wound. In this case it is absolutely necessary, to make an opening at the back part of the *thorax* ; allowing the other to close as soon as it will. The eligible part for making this incision, if we can number the ribs, is between the third and fourth of the false ribs, counting from below upwards, and about five inches from the *spine*, more or less, according to the size of the patient ; if we went lower, we should be in danger of wounding the *diaphragm*, or the abdominal *viscera* ;* by making the incision higher up, there would not be a convenient depending

* *Ruyfch* mentions a case, in which a surgeon not being acquainted with the situation of the *diaphragm*, penetrated the *abdomen* instead of the *thorax*, in attempting to perform this operation.

depending opening obtained, for the discharge of blood or matter; nearer the *spine*, we should cut the *dorsal* muscles, and run the hazard of wounding the *intercostal* arteries; and were the opening farther from it, the patient would be obliged to lie in an uneasy posture, to promote the discharge of the fluid. If the patient is fat, and the parts *emphysematous*, or otherwise swelled so that we cannot reckon the ribs, by bending his arm, and placing his hand upon his breast, and then measuring four inches from the inferior angle of the *scapula*, and about five from the *spine*, we shall come pretty near the place already described.

Having fixed upon the place, and finding reason to think the vessels have done bleeding, by the strength and equality of the patient's pulse, and warmth of his extremities, the operation is to be thus performed. Place the patient in a good light, and convenient posture, which is leaning a little forward, and inclining to the opposite side; then mark the part precisely with a pen and ink, and make an incision about an inch long, between the ribs, and parallel to them, rather nearer

the lower than the upper rib, to avoid the *intercostal* artery, which runs in a groove in the inferior edge of the rib ; lay the *intercostal* muscle bare first ; and then divide it cautiously, making a small opening through the *pleura* ; and if the lungs do not adhere to it, they will then immediately recede, by the admission of the external air ; giving room to enlarge the opening, as much as shall be thought necessary, without hazard of wounding them : and should they adhere to the *pleura*, they must be gently separated with the finger, to give room for the discharge of the fluid. The adhesion is seldom so strong, as not to admit of separation in that manner. Should the lungs happen to be slightly wounded in the operation, little danger is to be apprehended, in consequence of such accident. After the opening is made sufficiently large, the patient's posture is to be altered into that, which is most favourable for the evacuation of the blood, or other fluid contained ; assisting the expulsion of it by the efforts of respiration. When this is done, in order to preserve a free discharge, a flat hollow tent, properly made of lead, with ears,

ears, and covered with common plaster, may be introduced, after dipping it into the balsam mentioned in pag. 139 ; dressing the wound, in other respects, according to the general rules, applying easy compress and bandage ; the napkin and *scapulary* are commonly used in these cases, but a piece of flannel, properly hollowed where it passes under the arms, having suspensory pieces to go over the shoulders, is preferable to any other bandage, in all disorders of the breast, as it yields to respiration. — When the quantity of the matter discharged is small, and of a good consistence, the tent is to be left out, and the wound dressed superficially.*

Bleeding, laxatives, and an exact regimen, are of the utmost consequence to be observed
in

* *Tulpius* tells us of a person, who had a tent shut up in his *thorax* six weeks, which was then voided by the mouth ; and that the patient recovered. — *Hildanus* relates such a case, in which the tent was expelled by coughing. — *Fab. ab Aquapendente* gives an instance, that proved fatal, by a tent remaining in the *thorax*. — Some surgeons disapprove of all kinds of tents after the operation. — *Monf. Petit*, instead of a tent, recommends a piece of cloth, cut with a kind of tail, to be introduced, after being dipped into some vulnerary balsam.

in these cases, after the operation, as well as before; but if the patient has lost a great quantity of blood, or is of a weak constitution, then bleeding must be omitted, or used with great caution and very sparingly, lest we sink the patient too much by that evacuation. Vulnerary decoctions, soft balsamic medicines, &c. may be used to advantage on these occasions; a variety of which are to be found in practical writers: and if the patient is disturbed with a cough, recourse must by all means be had to opiates occasionally.

We have proceeded to the performance of this operation, upon a supposition of a quantity of blood extravasated in the *thorax*, and that the wounded vessels were closed: however, should it prove otherwise, we may endeavour to consolidate them, by mild astringent, balsamic injections, repeating bleeding according to the patient's strength, observing the preceding rules. Nothing else can be attempted to any purpose, but much more is to be feared than hoped, under these circumstances.

If a person has received a thrust with a sword or other weapon, quite through the
thorax,

thorax, in a direction that makes this operation unnecessary, both orifices at the time of dressing must not be opened at once ; because so much air might then enter, as when rarefied by the warmth of the part, might expand and compress the lungs, causing suffocation : hence it is always proper to have the circumambient air made warm, at the time of dressing wounds that penetrate the breast, as the admission of it in that state, will not produce such effect. For the same reason, it should be so contrived, that the patient may inspire pure, fresh air in his room, to procure a free expansion of his lungs, in order to expel that, which may be collected in the cavity. In this point, we must consider the season of the year, and the degree of heat or cold, to regulate this important matter, which in general is not enough attended to.

We now come to the last species of wounds of the *thorax*, in which the *viscera* are injured.—When the lungs are expanded, they possess the greatest part of this cavity, consequently are most in the way of being wounded ; the signs of which are a frothy, florid blood, discharged by the wound, and
by

by the mouth, attended with coughing.—
 When a wound in this part is deep, and any considerable vessel belonging to it opened, we must not expect success; small wounds of it may be cured, but even such must be looked upon as dangerous, and the event very precarious, were it only on account of the penetration of the wound into the breast.*

What we have to do in wounds of the lungs, is to keep the vessels empty by repeated venesection and revulsion, in order to make the circulation more languid, that less blood may be poured out by the divided vessels; giving them an opportunity of collapsing and uniting; and astringent, balsamic, incoagulating, and pectoral medicines, by injection as well as otherwise, are recommended. Laxatives by the mouth, or by way of clyster, to keep the body moderately open, must not be omitted. Soft, cooling diet must be kept to, avoiding all heating and stimulating things.

* Many testimonies might be produced of cures in wounds of the lungs, as well as in those only penetrating the *thorax*, from observators of the best authority; as *Ruyfch, Tulpius, Fallopius, Horstius, Arcaeus, Schenkius, Belloste, &c.*

things. A strict observance of the non-naturals, in every respect should be enjoined ; keeping both body and mind as quiet as possible, which attention is of the utmost consequence, when we are endeavouring to stop the effusion of blood, and consolidate the vessels. Under these circumstances, the prudent use of opiates is of infinite service, especially when the patient is disturbed with a cough, as generally happens.

Concerning the treatment of the wound in general, what we have already said, in respect to penetrating wounds of the *thorax*, is direction sufficient ; and in this case, the operation for the *empyema* may oftener be found necessary.—Should a part of the lungs protrude, appearing in a livid or mortified state, it is to be cut off. *Roscius* says, in his epistle to his friend *Hildanus*, that he succeeded thus in such a case ; but his surgery was formidable indeed, the operation being performed with a red hot knife, through an absurd notion which prevailed in his days, that an *hæmorrhage* would be prevented by it.*

A wound

* Vid. *Hildani Opera*, Cent. 2. Ob. 32.—Vid. *Tulpium in Observat. Med. lib. 2. cap. 18. de vulneribus cordis.*

A wound penetrating either ventricle of the heart, the *aorta* or *vena cava*, will produce almost the same appearance, as a great and impetuous flux of blood ; but this flux will be greater, and the blood more florid, when proceeding from the heart or *aorta*, than when it comes from the *vena cava*. Palpitation of the heart, cold sweats, universal paleness, &c. are the forerunners of death. All that is to be done under these melancholy circumstances, when the vital powers are near abolished, were a surgeon present, would be to stop the wound close up with some soft substance ; making strong pressure upon it, as it may sometimes be of great consequence, to prolong the patient's life, though only for a few minutes.

When we have reason to believe the wound of the heart is only superficial, the case is to be treated, as has been advised in wounds penetrating the *thorax*. There are histories of cures in these cases, dangerous as they are, to encourage our perseverance in all rational means, and hope for a happy event. Upon this occasion, *Bartholine*, *Schenkius*, *Paré*, *Van Swieten's*

Swieten's Commentaries upon *Boerhaave's* Aphorisms, the *Miscellanea curiosa*, &c. may be read.*

What has been said in pag. 104, 5, 6, 7, and 8; and 332, 3, 4, 5, concerning wounds of the *œsophagus*, *trachea*, and *bronchia*, makes it unnecessary to take any farther notice of them here.

As there is such a close connection between the *thoracic duct* and receptacle of *chyle*, it may give clearer ideas to mention them, and the management of their wounds together, though their residence is in different regions. This reservoir is supplied by the lacteals, arising out of the villous coat of the intestines, after passing through the mesenteric glands, collecting an additional fluid from thence. It is situated at the side of the *aorta*, near the superior mesenteric artery, between the last *vertebra* of the back and first of the loins. The *thoracic duct* or canal, runs from it along the *spine*, between the *aorta* and *vena azygos*, as far as the fifth *vertebra* of the back, where
it

* *Rodericus a Veiga* relates the story of a deer, which was killed in hunting, in whose heart was fixed a piece of an arrow, that appeared to have been there some time.

it passes behind the *aorta*, ascending to the left subclavian vein, into which it empties the *chyle*. In two subjects I have seen a double *thoracic duct*, which *lusus naturæ* is worth bearing in mind, as will appear presently.

The signs of a wound in the receptacle or *duct*, are the discharge of a grayish white fluid, the patient shrinking and becoming daily weaker, being deprived of nutrition, though he takes food. Sometimes, after having taken aliment, the discharge of this chylous fluid is not only increased, but appears whiter.

It is rational practice to prescribe subastringent, and balsamic injections, with a view of consolidating the wound, keeping the patient strictly to a soft, nutritive diet, so sparingly as but just to support life; and in case there should be only a small puncture in the receptacle or *duct*, or only one of the branches of the *duct* wounded, when it happens to be double, this treatment of the patient may succeed; otherwise wounds in these parts must be deemed fatal, without resource.*

The

* *Langelottus in Epistola ad Thomam Bartholinum* mentions the case of a nobleman to this purpose.—Vid. *Boneti Sepulchret. lib. iv. sect. 3.*

The *diaphragm* is a muscle of the greatest importance in respiration, as we have observed; consequently, when wounded, that compound motion must be rendered difficult and painful, under which circumstance, the patient endeavours to perform, or facilitate its action, by raising the ribs. If we consider the structure, origin, and insertion of it, with its necessary motion, the reason of these appearances will be very evident. Besides the laborious and painful respiration, the patient is generally subject to a cough, attended with a fever, and often with such symptoms, as accompany a *phrenitis*. The *phrenic* nerve is derived from the *cervicals*, whence also branches are sent to the *deltoid* muscle, and the top of the shoulder; which nervous communication will enable us to account for the patient's complaining of pain in those parts, when the *diaphragm* is affected.*——I have somewhere read of a *gladiator*, who died

VOL. I. B b laughing,

* See what professor *Monro* says in his dissertation upon the nerves at the end of his *Osteology*, concerning their communication and sympathy, in respect to the symptoms attending injuries of the *diaphragm*, the liver, and other *viscera* connected with that muscle.

laughing, in consequence of a wound in this part.

According to the general opinion of writers, wounds in the tendinous parts of the *diaphragm* always prove mortal; but there are instances of those who have recovered of wounds in the fleshy parts of it.—In these cases, we must first endeavour to stop the flux of blood, if it is to any considerable degree, repeating *venesection* occasionally, and enjoining a strict regimen, with the observance of the rules directed in penetrating wounds of the *thorax*.—In order to promote the agglutination of the wound, mild balsamics may be injected; taking all possible care to obtain a depending opening, that the blood, matter, or injection, may have as free and uninterrupted an egress as possible; and treating the wound, in all other respects, according to general directions, using embrocations, fomentations, and cataplasms, &c. as pain and tension of the *abdomen*, &c. and the urgency of the symptoms may require.

Glandorpheus says he cured a wound in the carnous part of the *diaphragm*; but could
not

not succeed, when his patient was wounded in the tendinous part of it.

Hollerius pronounces the latter incurable, but not the former ; saying, he observed in a man, who was executed and dissected in the physic-schools, a *cicatrix* in the fleshy part of the *diaphragm*.

Alexander Benedictus speaks of a soldier, that was perfectly cured of such a wound.

It is not possible to determine, with precision, concerning the event in wounds of the *diaphragm* ; therefore we should be cautious in our presage. Should we heal the wound externally, dreadful consequences might follow, from some of the *abdominal viscera* insinuating themselves even into the *thorax*, through the wound.—*Bonetus* has a collection of such examples ; and *Paré* relates the case of a captain, who was shot through the fleshy part of the *diaphragm* ; and though the wound was apparently healed, yet the patient complained of a disorder in his stomach, and of pain like the colic ; eight months after, the pain became more violent, and he died in a short time. His body was opened by *Guillemau*, a man of great emi-

nence, bred under *Paré*, who found part of the *colon* in the *thorax*, which had passed the wound of the *diaphragm*.——I once saw a body opened, wherein part of the stomach had passed, through a breach of the *diaphragm*, into the *thorax*; but had no opportunity of knowing the circumstances of the case, during the patient's life.

In a wound of the *mediastinum*, the patient complains of pain immediately under the *sternum*, to which it is attached. In order to judge, whether this part has suffered, the depth the weapon entered, and the direction of it, are to be considered. This is the least dangerous part to receive a wound in, of any in the *thorax*. Wounds here are to be treated according to the general rules.*

The *pericardium* is a very strong membranous bag, inclosing the heart, and lying loosely over it, connected to it only at its base,

* Some authors recommend trepanning the *sternum* in collections of matter, &c. in the *mediastinum*. I think Baron *Haller* mentions a singular case of this kind in a Dutch divine.——See *Monf. Martiniera's* excellent *Memoire sur l'Operation du Trepan au Sternum*, in vol. iv. of the *Mem. de l'Acad. Roy. de Chirurgie*.

base, and to the great vessels, that enter it there ; it lies in contact with the *diaphragm*, with the flat side of the heart upon it, and is closely connected with the *mediastinum*: however, wounds of the *pericardium*, for obvious reasons, must be deemed much more dangerous, than those of the *mediastinum*.—In order to form our judgment, in respect to a wound in this part, we are well to consider its situation, the nature of the weapon, by which it was inflicted, with other circumstances.—It is to be treated according to the rules prescribed in penetrating wounds of the *thorax*, &c.

Benivenius mentions the case of an *abscess* formed in the *thorax*, which, upon being opened, discovered an erosion of the *pericardium*, and some part of the heart bare ; yet the patient recovered.

Cardanus, in *Comment. Aphoris. Hippocratis*, says he saw some portion of the *pericardium* taken away, and the patient cured.

Upon the authority of *Galen*, *Marulus*, the son of *Mimographus*, was cured after removing some of the putrid *pericardium*, and leaving the heart exposed to view.—The same au-

thor relates a case, in which he removed part of a carious *sternum*, found the *pericardium* in a putrid state, and part of the heart naked.——Some years ago I cured a person, after taking away about three inches of the whole substance of two ribs ; in which case, I could plainly discover the *pericardium* ; and the pulsation of the heart threw the matter out at the opening.

Many writers have taken notice of adhesions of the *pericardium* to the heart.——Doctor *Hunter* told me, he had observed a total adhesion ; and that he once found a great collection of purulent matter in the *pericardium* of a child. He gave me an history of a soldier's case, who died suddenly, as he was walking over *Berwick* bridge ; upon opening whose body, the *coronary* arteries were found ruptured, and the *pericardium* full of blood.——*Bonetus* relates a case, in which the *vena cava* was ruptured, and the *pericardium* filled with blood.*

OF

* Vid. *Bohnium de Thoracis Vulneribus lethalibus.*

OF WOUNDS OF THE ABDOMEN AND ITS
CONTENTS.

THE cavity of the *abdomen* is divided from the *thorax* by the *diaphragm*, and lined with the *peritonæum*; which is a reflected membrane, from whence are derived the external coats of the *intestines* and *abdominall viscera*, as the same coats, investing the *thoracic viscera*, are from the *pleura*.

The upper part of the *abdomen* is called *epigastrium*; the two lateral cavities, *hypochondria*; about three inches above and below the navel, is termed the *umbilical*, and the lowest the *hypogastric* region, which extends to the *pubes*.

The parts contained in the *abdomen* are, the stomach, small and great intestines, the *mesentery*, connecting and confining them in their places; the *omentum*, *liver*, *gall-bladder*, *spleen*, *receptaculum chyli*, *aorta descendens*, *vena cava*, and *pancreas*; and the *kidnies* with the *ureters*, may be looked upon as situated

here, though, strictly speaking, they are not contained within the cavity.*

Wounds of the *abdomen* may properly be divided into three kinds, as were those of the *thorax*. 1. Those of the teguments, muscles, and containing parts, not penetrating the cavity. 2. Those which penetrate the cavity, without wounding the *viscera*. 3. Those wherein the *viscera*, or any of the contents of this part, are injured.

The first kind is known by the eye, by examination with the finger, probe or bougie; considering how the weapon was directed, with the length it entered, and by injections. In all these expedients, to discover the nature of the wound, we must never forget to place the patient, in the same posture he was when it was inflicted, if this can be learned from him, or any person present. It is more difficult to discover a penetrating wound of the *abdomen*, than that of the *thorax*, especially in corpulent people, on account of the great quantity

* See doctor *Stukeley's* beautiful and accurate plate of the human *viscera*, in his *Anatomy of the Elephant*, published with his excellent *Lecture upon the Spleen, &c.* in the year 1723.

quantity of fat upon that part ; and the muscles being more moveable, a small alteration of the position of the body may prove a great obstacle to the introduction of a probe of any kind, and deny the admission of an injection. We should consider every symptom and circumstance, to direct our judgment in this momentous point ; and when we are fully assured, that the wound does not penetrate the cavity, we are to treat it according to the general rules laid down in the management of wounds ; remembering, if it is a deep incised wound, though not quite to the *peritonæum*, that it is of the utmost consequence to endeavour to form a very strong *cicatrix*, to resist the dilatation of that yielding membrane against the pressure of the *viscera*, and prevent the formation of a *hernia*, in consequence of such a wound ; on which account it is advisable, by all means, to insist upon the patient's wearing an easy compress and bandage, for some time after the wound is healed.—As deep and large incised wounds here are very apt to produce *herniæ*, so deep and extensive punctured wounds, without judicious care and management to obtain ample

ple depending openings, may soon degenerate into sinuous ulcers, hard to cure ; of which we may be convinced, by considering the structure of these parts, with the great quantity of *adipose* and *cellular* membrane in them, where compression must lose much of its power and effect, having no subjacent bone, to assist this means of uniting them ; which was remarked by *Celsus* : and upon this occasion, we may consult *Tulpius*, *La Motte*, and other observers.——*Sennertus* relates a singular instance of the dilatability of the *peritonæum*, occasioned by a blow, which a pregnant woman received, at the bottom of her body ; in consequence of which, a small tumour appeared soon after the accident, but as the *fœtus* grew, and distended the *uterus*, both together made their way into the *peritoneal sac* ; out of which, after making incision, the *fœtus* was taken alive, in the presence of the relator.——*Tulpius* gives a narrative of a ventral *hernia* proceeding from a wound, and which, being neglected, caused the patient's death, six years after the wound was cured.

A penetrating wound of the *abdomen* will generally be discovered, by the means we have proposed ; but to put the matter beyond all doubt, when the wound is large, there will commonly be a protrusion of the *omentum*, *intestines*, or other of the *abdominal viscera* : and when aliment, chyle, bile, fæces, or urine, is discharged, we cannot hesitate a moment in pronouncing the penetration of the wound ; and the part injured will be declared, by these respective evacuations.—Should the symptoms be favourable in a penetrating wound, without extreme pain, tension, inflammation, fever, fainting, &c. or any such discharge, as mentioned above, we have good reason to believe none of the *viscera* are hurt.* In this case, we are first to endeavour to expel the air out of the cavity, as was directed in penetrating wounds of the *thorax*, excluding it as much as possible during the cure ; following the general method directed in the treatment of wounds, by stitching or otherwise, according to the circumstances.

* *Wiseman* and *Muys* testify, that people have been pierced through the body, without having the *intestines*, or any of the *viscera*, wounded.

cumstances. Great practitioners differ in their sentiments concerning the use of *gastrography*, which will be described presently. Some are of opinion, that it is better to omit stitching entirely; but there are cases requiring the practice too evidently, to doubt of its propriety. Whether stitching is practised or not, the patient must be kept wholly confined to his bed, and in such a position of his body, that the *viscera* may not press forcibly against the wound; yet with such an inclination, as may best favour the discharge of the matter, dressing the wound gently with even pledgets of lint, dipped into some warm vulnerary balsam, such as have been mentioned, and a plaster of *cerat. album*; before the application of which, embrocating the whole *abdomen* well with warm oil may prove very beneficial, in preventing tension, &c. The compress and bandage should be soft and easy, and the bandage made with flannel, as directed in the wounds of the *thorax*, is advisable for the same reason. It is much better to have it in that manner, and to be fixed by pinning or lacing, on the side opposite to the wound, than in the form of a roller;

roller ; the application of which is more troublesome, nor can it be made to press so equally. This kind of bandage is likewise preferable after tapping. The repetition of the dressing is to be governed by the discharge of the wound, and other circumstances, as the prudent and judicious surgeon sees occasion. Invariable rules cannot be prescribed ; but when nothing forbids it, seldom dressing is found most conducive to the cure.—

The patient must submit to a spare, liquid diet, have his body kept open, and loose blood occasionally, as fever, inflammation, &c. shall indicate ; having a proper regard to his constitution, and customary way of living, as was hinted in the general account of the treatment of wounds : and a strict observance of all the non-naturals should be attended to, throughout the cure, which are still more essentially necessary to be regarded, when any of the *viscera* have received an injury, by being exposed to the air, or in any other manner.

When the *intestines* protrude, and are not injured, they are to be reduced immediately, if possible, by gradually and gently pressing them

them in with our fingers ; but when wounded, the *glover's future* must be used, leaving three or four inches of the ligature out of the wound : and when they have been out, and exposed to the air for any considerable time, it is necessary, first to foment them with some emollient liquor, moderately warm, as milk and water with a little oil, fresh meat broth, &c. but should the orifice be small, and the stricture great upon them, by reason of their being distended with air, &c. small perforations, &c. with an awl, have been advised by *Paré*, and others ; but I cannot speak to this practice from my own experience.* It may be better to follow *Celsus's* advice, as I have occasionally done, who says. “ *Si angustius vulnus est quam ut intestina commode refundantur incidendum est, donec satis pateat.*”† In order to enlarge the wound, we must carefully introduce a very small director,

* Doctor *Law*, of *Glasgow*, recommended puncturing the *hernia intestinalis*, with a view of evacuating the air, and facilitating thereby the reduction of the *intestine* ; and the late celebrated *Chandos* professor at *St. Andrews*, doctor *Simson*, approved his method.

† Lib. 7, cap. xvi. *de ventre icu perforato.*

director, to avoid injuring the *intestines*, and then pass a slender curved knife, with a blunt point, in the groove of the director, firmly held against the *peritonæum*, whilst we are dilating the wound, as far as shall be found necessary, to admit of their reduction with ease : but when there is room gained for the introduction of the finger, that will prove the best and safest guide to pass the knife upon : other instruments have been used and invented by some surgeons ; but this seems to be the best method of dilating the wound. Should the stricture be found so great and unequal, according to the nature and difference of the wounded parts, as that the director cannot, without violence, be introduced directly into the cavity at once, we must do it, by cutting gradually, after having first endeavoured to obtain some liberty, by drawing the *intestine* gently farther out : and should we meet with an insuperable difficulty in passing the director, from the stricture at its entrance, we may slip a little way under the edge some very thin, smooth instrument made of wood, cutting upon it with the point of a common incision knife ;

and

and having thus gained sufficient room for the finger or director, proceed, with the blunt-pointed knife, to finish the incision; keeping the *intestine*, during this operation, as warm as possible with a flannel stupe. First of all, before we begin the dilatation of the wound, we must be mindful to place the patient in a suitable position, with his hips a little elevated, in order to facilitate the reduction or falling back of the prolapsed body, when the wound is dilated; for the natural tendency downwards of the parts within the *abdomen*, together with the action of the *diaphragm* and other muscles, may not only much obstruct the return of the prolapsed body, but throw more *intestines* out, when the stricture is removed. As soon as we have sufficiently enlarged the wound, we must reduce the *intestine*, if in a proper condition to be returned into the body, by gradually pressing it in, as much as we can, in the order it came out; and then shake the body in various directions, with a view of settling it in its natural situation. Monsr. *Arnaud's* precaution is not amiss, as mentioned by *Garengéot*; which is, to be careful we do not thrust the
intestine

intestine between the *musculus rectus* and its *aponeurotic* sheath, which does not closely adhere to it, instead of putting it into the *abdomen*, when the wound is near the *linea alba*, below the navel.

If the *omentum* is fallen out of the wound, remaining in a condition to be returned with safety, which may be known by its moisture, warmth, and degree of redness, denoting vitality, it is to be done speedily ; but when the *intestine* protrudes at the same time, it will be proper to reduce it first, that it may more readily fall into its true situation ; besides it will bear compression better than the *omentum* ; which is a soft adipose substance, and will be more easily returned after the *intestine*, without the danger of injuring it. Should it be grown cold, hard, and ill coloured, which change may soon happen in a body of such texture and composition, when exposed to the external air and strangulated, the common practice has been, to pass a ligature about it, and cut off the putrid or mortified part with knife or scissars, about half an inch from the ligature. A better way of performing this operation appears to be, by

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passing a large needle through the middle of the part, with a double flat ligature, or very narrow tape, tying the separate parts of it opposite ways, only moderately tight, lest they should cut through such a tender substance, and frustrate the intention of stopping the *hæmorrhage*, that might probably ensue; leaving a sufficient length of them out of the wound, when the sound part of the *omentum* is placed just within the lips, suffering it there to rest, and the ligatures to digest off, without using any force to separate them; at the same time, endeavouring to preserve an opening at the inferior part of the wound, for the evacuation of any fluid, that may collect in the cavity.—*Garengéot*, upon his own authority, as well as that of other eminent surgeons, disapproves the ligature, advising excision of the altered part of the *omentum*, returning the sound, as has been directed.—*Forestus* gives a history of a fatal *hæmorrhage*, in consequence of excision.—These considerations should make us the more attentive to the state of the part, and appearance of the vessels in it, in order to determine the propriety or impropriety of the ligature;

ture ; for they may retain a circulating power, when the soft substance of the *omentum* is corrupted.*

After the prolapsed body or bodies, found or injured, are thus returned, the wound is to be treated, as has been directed in penetrating wounds of the *abdomen* without protrusion of *intestine* or *omentum* ; and should it be thought advisable, to lay pledgets gently down to the bottom of the wound, it is a necessary precaution, to tie the threads unto them, to prevent their being lost in the cavity. Under some circumstances, a hollow tent, made with thin sheet-lead covered with plaster, may be found useful, by allowing a more free and uninterrupted discharge of matter, that may collect in the cavity ; and I have experienced its usefulness in similar cases.—Though some modern writers absolutely forbid the use of tents in penetrating

C c 2

wounds

* See what *Verdier* and *Pipelet* say upon this subject, in the 3d vol. of the *Mem. de l'Acad. de Chirurgie*, and *Pouteau*, in his *Melanges de Chirurgie*.

Mr. *Pott*, in his *Chirurgical Observations*, disapproves of making ligature upon the *omentum*, from some unfavourable events, which he ascribed to that practice.

wounds of the *abdomen*, as well as of the *thorax*, yet this point, from the nature of the circumstances, must be left to the surgeon's discretion, who will not forget endeavouring to make the wound as much depending as possible, by position of the body or otherwise : and when there is great tension, &c. of the *abdomen*, fomentations, embrocations, and cataplasms, of the emollient and discutient kind, may prove very beneficial, and should by no means be omitted.*

OF

* In respect to the use of tents, see a note in *Heister*, in the chapter upon *Gastroraphy*. And relative to this subject, may be read *Petit's essays, sur les epanchemens dans le bas ventre, en Mem. de l'Acad. de Chirurg. tom. I, 2.*

OF GASTRORAPHY.

THE future called *gastroraphy*, or stitching the belly, which we are about to describe, is in a great measure exploded. It is indeed quite useless in small wounds; but necessary in those of large extent in all directions; more particularly when they are inflicted transversely in the inferior part of the *abdomen*, in order to prevent the falling out of the *intestines*, &c. which they are very apt to do, by their own gravity and the compressive force of the muscles.

There are two methods of practice in performing *gastroraphy*. The one, is no more than the common interrupted future, only it must be made with a curved needle of the largest size, and a flat ligature, or tape, in proportion, taking good hold of the parts, to prevent its breaking out, observing, that the *peritonæum* and muscles correspond, and that they be pierced with the needle at the same distance from the edges of the wound: making such a number of stitches, as the

length of it requires, and leaving a space of about an inch between stitch and stitch.

The other method of stitching the belly, is called the quilled-future, because quills were formerly used in performing this operation ; but rolls of plaster, plaster rolled round wax-candle, or large pieces of common bougie, are preferable to quills ; for they may be better adapted to the parts, and will lie easier upon them.

The most simple and ready way of making this kind of future is, to pass double ligatures in one needle, in order to include the rolls at one end, and be tied upon them on the opposite side with bow-knots, which will give an opportunity of straitening, or loosening the ligatures occasionally, with very little trouble. After passing in as many ligatures, as the extent of the wound demands, the lips of it are to be gradually brought together, and kept so, by a judicious assistant, when such a necessary person can be had ; the rolls are then to be carefully adjusted, that their bearing may be exact, regular, and easy, tying the ligatures as above described.

After

After the performance of this operation, the wound is to be dressed with some vulnerary balsam, &c. embrocating the whole *abdomen* well with warm *ol. olivar.* and applying comprefs and bandage, as has been directed; placing the patient in a favourable posture for the discharge of blood or matter, that may happen to be lodged in the cavity; avoiding, as much as is consistent with answering this necessary purpose, such a position of the body, as must put the stitches upon the stretch at the same time; strictly enjoining rest, as motion is diametrically opposite to the present intention.*

Authors formerly directed, that a tent made with lint, having a thread tied to it, should be introduced into the inferior part of the wound after stitching, though there were no evident signs of blood, or other

C c 4

fluid,

* When it is thought necessary to remove this future, the dry future, or strips of common plaster, may prove very useful, in order to prevent a separation of the *cicatrix*, &c. the surgeon not forgetting, for farther security, to place an easy, well adapted comprefs under the bandage, which requires, for obvious reasons, to be worn for some considerable time.

fluid, to be evacuated out of the cavity ; but the supposition of something being lodged there, is the only justification of the practice ; for, as we have observed, tents may prove very detrimental by irritation of the sensible parts, causing pain, inflammation, &c. and protracting the cure ; but should a tent be found necessary to keep the part open, a hollow one, made as has been described, or a piece of bougie, is far preferable to a tent made of lint, or other material, that will, by imbibing moisture, swell in the wound, and obstruct the egress of any fluid between dressing and dressing : and besides preventing the inconvenience arising from the increase of size of any substance introduced, the bougie, when dipped into some soft balsam, will slip readily, and rest in the wound, with little or no uneasiness to the patient ; but the composition used in preparing the bougie should have no stimulating ingredient in it. We should not forget to secure either by a ligature, for fear of its slipping into the cavity. Our main business now is obviously to give a free discharge to whatever fluid is contained, and to promote digestion of the wound ;

wound ; endeavouring, as much as possible, to prevent or remove tension, inflammation, fever, &c. The wound itself is to be treated as has been directed, and the same means used, to obviate or remove the supervening accidents, as bleeding, laxatives, emollient clysters, strict regimen of diet, &c. as have been advised in penetrating wounds of the *abdomen*. By due attention to these general rules, *Albucasis* says, he speedily cured a very large wound, attended with a protrusion of a great portion of the *intestines*. And *Galen* speaks of extensive wounds in the *abdomen* ending as happily, where the *omentum* protruded.

We now come to consider more particularly wounds of the *viscera* contained in the *abdomen*, with the treatment of them.—In our endeavours to discover them, we must always attentively take under consideration the direction of the weapon, the length it entered, the natural situation of the *viscera*, the attitude of the body when the wound was given, and observe whether the contents of any of these *viscera* are evacuated by the wound. We should also pay due attention
to

to the pain, fever, inflammation, syncope, &c. remembering that a wound, in any of the *viscera*, generally occasions an universal tension of the *abdomen*.*

The stomach is situated under the left side of the *diaphragm*, just below the smaller lobe of the liver, passing down a little way, and then turning over the *spine* to the right side; in shape much resembling the pouch of a bag-pipe. It lies in an oblique direction from left to right, and has a substance called *mesogastrium*, in its concave part, between the orifices attaching it to the subjacent parts. Its superior orifice, called also the *cardiac*, is on the left, and the inferior or *pylorus*, on the right side of this organ.

In wounds upon the region of the stomach, besides considering the direction of the weapon, and examining the length it penetrated, it is necessary to inquire, whether the patient's stomach was full or empty, at the time the wound was received. We are then to observe, whether he has the symptoms, that
commonly

* Vid. *Bohnius de Abdominis Vulneribus in Renunciatione Vulnerum.*

commonly attend injuries done to this part, as sickness, vomiting, singultus, languor, anxiety. If the weapon has entered the cavity of the stomach, dividing the vessels, blood will be thrown up at the mouth, and probably the aliment will come out at the wound ; if not, it must fall into the cavity of the *abdomen*: violent pain ensues, the pulse becomes languid, clammy sweats arise, and the extremities grow cold. These are the general symptoms ; some, if not all, of which accompany wounds of the stomach ; and in the *diagnosis*, they have been denominated mortal wounds, or such as are incurable by art : yet, as we have observed, there being many surprising instances of success in such cases, we are, after making a proper *prognostic*, to endeavour to assist nature all we possibly can.

The method proposed to assist nature is, to repeat venesection as often as the patient's strength will allow, in order to prevent, or remove inflammation ; to which membranous parts are very liable, and which may soon terminate in a mortification, without the greatest attention to obviate it. The patient

is to be kept to a soft diet, taking a very small quantity at a time, to avoid distention of the stomach, which would disappoint nature's operation in the cure of the wound : we should therefore endeavour to give some support by the frequent repetition of nutritive clysters, made thin, that they may be the more readily absorbed, as well as by aliment taken at the mouth, in the cautious manner which has been directed ; enjoining a strict observance of all the non-naturals, and confining him to his bed, lying upon his back. By paying a due regard to this method, a dangerous *hæmorrhage*, pain, fever, inflammation, &c. may be prevented, or removed, as far as the nature and circumstances of the case will admit ; and an opportunity given to the wound of uniting, and the fall of any thing into the cavity of the *abdomen* hindered, which probably would prove of fatal consequence.*

Should

* The case of Mr. *Atkinson* communicated to the Royal Society on this occasion, is very pertinent, and worthy of notice.—Also there is a letter in Mons. *Le Dran's* Consultations worth reading on this occasion ; and what
doctor

Should the wound in the stomach present itself to our view, it may be stitched as has been directed when the *intestines* protrude wounded.—Some surgeons have recommended stitching the stomach to the *peritonæum*.—*Vander Wiel* relates two cases, so treated with success : and *Purmannus* assures us, he has succeeded in this operation. However, when the wound does not offer itself to our view, the difficulty and danger of attempting to find it, should discourage our search ; under which circumstance, the most rational method of treating the patient is that we have delivered : and whether the wound is stitched or not, it is to be managed as has been directed in other penetrating wounds of the *abdomen*.

Glandorpius relates a very memorable case from *Florianus Matthæsius* of *Brandenburgh*, of a man at *Prague*, who swallowed a knife eight or nine inches long, which pointing at the superior part of the stomach, he cut upon and extracted, seven weeks and two days

doctor *Tiffot* says, in his *Avis au Peuple sur sa Santé*, chap. 29. is worthy notice. That is a book of great merit and utility.

days after it was lodged in his stomach, and perfectly cured the patient.

Fallopins says he cured two persons of wounds, which penetrated the cavity of the stomach, though the aliment passed through.

Jacobus Orthæus tells us, that in the city of *Fuldana*, a soldier was wounded in the stomach; and that immediately upon taking food, it came through the wound: in which case, the stomach was stitched to the edges of the wound of the teguments, and cured by two judicious surgeons, who affirmed the fact to *Orthæus*.

In the *Miscellanea Curiosa*, is an account of a *fistula* remaining after a wound in the stomach, through which some of the aliment passed, the person living eleven years in that condition.*

The small *intestines* are about five times the length of the body, consisting of the *duodenum*, *jejunum*, and *ileum*. The first is firmly fixed

* *Albucaſis*, *Becherus*, *Viega*, &c. mention cures of wounds in the stomach, through some of which the aliment was discharged.—See a case to this purpose in the third volume, wherein an abscess opened spontaneously, and discharged the contents of the stomach.

fixed to the subjacent parts, by *cellular* membrane, without having any *mesentery* annexed to it: it is continued from the *pylorus*, passing under the *colon*, and then reflected over the *spine* to the left side.—The *jejunum* is a continuation of the *duodenum*, taking its name where the *mesentery* begins; but it cannot be precisely ascertained, from any marks external or internal, where it ends, and where the *ileum* begins; however, according to *Winflow*, about $\frac{3}{5}$ ths of the whole length of both *jejunum* and *ileum* may be allowed the latter.—The *ileum* enters the side of the *cæcum*, which is the first of the great *intestines*, situated on the right, just above the *os ileon*, and, from its figure and pendent position, excrements, and extraneous bodies, are very apt to stop here, producing dreadful consequences.—The *colon* proceeds from the *cæcum*, and passes winding over the *spine* to the left side, under the stomach and spleen, and close to the kidney, where it goes over the brim of the *pelvis*, and turns into it; which turn is called the inferior sigmoid flexure.—The *rectum* begins where the *colon* ends, and terminates at the *anus*.—Having given this

cursor

curfory view of the intefstinal canal, the nature and treatment of the wounds in the different parts of it, may be better underftood.*

When the fmall *inteflines* are wounded, the digefted aliment is commonly difcharged at the aperture, and *chyle* with it, when the *lafteals* are divided; and fhould the wound be in the *duodenum* near the ftomach, *bile* may be mixed with the other fluids; the *biliary duct* may alfo then be opened, as it thereabouts enters that *intefline*. In the *duodenum* the excrements are thin, yellow, and frothy, and not fetid; in the *jejunum*, of a whitifh
or

* Mr. *Clover*, of the city of *Norwich*, a man of the greateft fkill in the difeafes of horfes, and of equal veracity, fhewed me a ftone weighing eleven pounds, which he took out of the *colon* of an old horfe, that did his work well to the laft, and died in good cafe. Upon fawing the ftone in the middle, it did not appear of the fame folidity in every part; it was formed upon a fmall fragment of a flint ftone, which we found in the very centre. — This fingular cafe brings to my mind, that of the *tabular* ftone, which was found in the *aorta* near the heart of a great perfonage, as mentioned by *Pifo* in his 101ft obfervation. — Stony concretions have been found in various parts of the body, but more particularly in the *glandular*: I once obferved them in the centre of the *glands*, after taking off a cancerous breast.

or ash colour ; and in the *ilcon*, viscid with *mucus*. These remarks may be of some use, to direct the judgment in respect to the part wounded.

The prognostic in these wounds is unfavourable, as we have demonstrated ; and they are classed among those of a mortal nature, with some exceptions, by the most eminent writers, as we have shown. When the *intestine* does, or does not protrude in such wounds, they are to be treated as those of the stomach. When a wound of the *intestine* comes not in view, we should not search after it, but rather endeavour to avoid exposing the part to the air, by which the danger might be increased ; as is exemplified in *Tulpius*, who blames a surgeon for searching too far, in order to discover the extremities of a gangrened *intestine*.—*Varicola* tells us of a young man, who shot himself into the *abdomen*, and a few days after voided the bullet by stool, and was cured without any bad accidents supervening.—*Hildanus* gives us the history of a person, who was wounded with a sword in the *abdomen*, the point of which breaking upon the thrust, re-

mained in his belly for a year, and was then expelled with his *fæces*.——Monf. *Littre* mentions a person, who received several wounds in the *intestines*, and yet recovered.——*Bohnius* cites many authors, showing us, that nature does more than art, and effects cures in many instances, beyond our conception: but if wounds of the teguments and intestines are large, it may be found very necessary to perform the glover's future upon the one, and *gastroraphy* upon the other, as has been described. The glover's future is to be made spirally, with a fine triangular-pointed needle, passing it at small distances, and with all possible exactness, leaving some inches of the ligature out of the wound.

When the large *intestines* are wounded, presenting themselves in that condition, they require stitching, and are to be treated, in all respects, as wounds of the small *intestines*; only, when they are wounded, and do not protrude, so as to admit of stitching, we must be very cautious in the injection of clysters, unless the wound be out of their reach, as the liquor may escape into the cavity of the *abdomen*, and produce much mischief. The

cæcum

cæcum is a bad part of the intestinal canal to receive a wound in ; as from its pendulous situation, whatever happens to be contained in it in consequence of such an accident, or any indurated *feces*, have to rise against their own gravity by the peristaltic motion. — Upon opening the duke of *Berwick's* body, it is said a ball, was found lodged in this part.

In a total division of the small *intestines*, in the superior parts near the stomach, the event must prove fatal, unless both ends can be stitched together, by which there is some chance of saving the patient ; however, should there be no possibility of bringing the lower extremity of the *intestine* to the other, which is apt to fall down into the cavity, all that can be attempted, in this case, is to stitch the superior part to the edges of the external wound ; which operation is related to have been done with success, in the *Acta Eruditorum Lipsiæ*, when there was length enough of *intestine* from the stomach, furnished with *lacteals*, for the absorption of *chyle*, necessary for nutrition of the body. — Monsr. *Littre* speaks of several such cases, and

Monf. *Mery* of one, in which artificial *ani* were made by this method.—I have seen one that remained at the navel, in consequence of an *exomphalos*, the patient living many years after; and once I had in view the making one in the *inguen*, on account of a mortification, which attended a *hernia* there, as related in the second volume of this work; but nature, assisted by art, perfected a cure beyond expectation. From what I observed in this case, and some others, it appears to me very rational practice, when we are called, and find the parts in that state, which does not admit of the operation for the *bubonocèle*, to open the tumour directly, in order to remove the stricture, and then treat the disease as a mortification in any other part.—The case related by Mr. *Jamieson*, in the 1st vol. of the *Med. Ess.* also encourages this practice, and demands particular attention.*

The *mesentery* is a duplicature of the *peritonæum*, connected by *cellular* membrane, expanding

* *Hollerius*, *Paré*, *Jacotius*, *Glandorpius*, &c. furnish us with many instances of cures in wounds of the *intestines*.

panding and receiving the guts as in a sling. It begins loosely upon the loins, extending to all the *intestines*, except the *duodenum*; but that part of it, which belongs to the great guts, is called *mesocolon*. It prevents the *intestines* from twisting, and keeps them in their proper places; it sustains the arteries, veins, lympheducts, and nerves, in their passage to and from the *intestines*, as has been observed; therefore wounds in this part may be attended with great *hæmorrhages*, and other dangerous symptoms. They are to be treated, as has been directed in penetrating wounds of the *abdomen*.

The *omentum* is attached, at the anterior part, to the arch of the *colon*; posteriorly, to the stomach; and laterally, to the *spleen*, *duodenum*, &c. It is an exceedingly fine membrane, floating upon the *intestines*, larded with fat, and resembling an apron, with beautiful branches of vessels like net-work.

When the *omentum* is wounded, and part of it prolapsed, appearing moist, warm, and reddish, showing that the circulation of the blood is not stopped in it, beyond a probability of being again put in motion by the

warmth of the body, it is to be returned again into the *abdomen* ; but what we have said, upon its prolapsion with the *intestines*, makes it unnecessary to add any thing more here concerning wounds of this part.*

The liver is a large irregular body, of a tender texture, vascular, and glandular. It is situated under the arch of the *diaphragm*, lying in contact with it, in the right *hypochondrium*, extending to the left. Its superior side is convex ; its inferior concave. It derives its external covering from the *peritonæum*, whence proceed, on its convex side, three ligaments, attaching it to the *diaphragm*.

The signs accompanying a wound in the *liver* are, a great effusion of blood, tinged with *bile*, when it penetrates far into its substance ; the patient complains of sickness and

* *Glandorpius* has a very memorable case of a wound in this part, received by a nobleman in a duel. *Specul. Chirurg.*—*Galen, de usu partium*, says, the use of it is to keep the subjacent *viscera* warm ; and he instances the case of a gladiator, who, having lost a great part of it, was ever after obliged to wear something to keep the *abdomen* warm.

and anxiety ; sometimes vomits blood, sometimes bile, and sometimes discharges blood by stool ; the *abdomen* grows tense and painful, and the pain frequently extends quite to the neck, inflammation and fever succeed ; and when cold, clammy sweats come on, attended with *syncope*, and coldness of the extremities, they are to be considered as the harbingers of death.

After having considered the nature and situation of the wound in this bowel, all that art can do to assist nature in the cure, is, by endeavouring to stop the *hæmorrhage* ; bleeding repeatedly as the patient's strength will bear ; keeping his body open, by the most lenient purgatives, or clysters, enjoining the strictest regimen, rest, &c. treating the wound according to the general rules observed in penetrating wounds of the *abdomen* with an effusion of blood, and making such applications to the whole *abdomen*, as the pain and tension shall require, and as already have been directed : but deep wounds in this part must determine us to presage an unhappy event, though there are upon record instances, well authenticated, of some cures

having been performed.—*Glandorpius* says, he cured a youth of a large wound in the liver.——*Sculdetus* relates such a cure.—*Hildanus* mentions a case, that ended happily, though the symptoms were very severe, where a piece of the liver was found at the mouth of the wound, separated by a sword.—But the most memorable example of all, is that recorded in the *Mem. de l'Acad. Roy. des Sciences*, for the year 1705, if I do not mistake the year, of a lunatic, who inflicted eighteen wounds upon himself, eight of which penetrated the cavity of the *abdomen*; the *liver*, the *colon*, and the *jejunum* suffering; yet, by frequent bleeding, a strict regimen, dressing seldom, &c. he was cured of the wounds, and recovered his senses; but relapsing about a year and half after, he laid violent hands upon himself, which gave the opportunity of knowing what parts were wounded, by opening the body.

The *gall-bladder* is of a pyriform figure, and situated on the inferior side of the great lobe of the liver, and its duct opens into the *duodenum*. Should it happen to be full of bile when wounded, some of that fluid may
be

be evacuated externally by the aperture, leaving no room to doubt, what part has been injured, especially when but little blood is discharged with it ; though it is more likely it should fall into the *abdomen*, where, as it is the most acrimonious fluid in the body, it may soon occasion very severe symptoms ; and for want of its being thrown into the *intestines* to stimulate them to an excretion of their contents, a fatal constipation may prove the consequence of that defect.

The treatment of the wound itself, and of the patient, in all other respects, differs very little from what has just been mentioned concerning wounds of the *liver* ; but unless we can make a depending opening into the *abdomen*, for the evacuation of this acrid liquor, we have reason to apprehend, all our endeavours will be in vain.—The dissertations of *Monf. Petit*, relative to this matter, and other extravasations in the *abdomen*, in the 1st and 2d volumes of the *Memoirs of the Royal Academy of Surgery*, deserve to be read with particular consideration and attention, to direct our judgment and assist our practice.

The following fatal, and very pertinent, case, was communicated to our Royal Society. An officer received a wound in the inferior part of the *gall-bladder*, without the adjacent parts suffering any considerable injury; but the consequent symptoms were very surprising; the *abdomen* was immediately distended, as if the patient had been afflicted with an *ascites* or *tympanites*, which inflation continued till his death, about a week after he received the wound. He had no eructations, or *borborygmi*, and his bowels remained obstinately constipated all the while he lived, purges and clysters having no effect; and though considerable doses of opiates were given, they procured little or no ease. The external appearance of the wound was pale, crude, and flaccid; on the fifth day he complained of a *nausea*, and had a slight hiccup; his pulse was strong, equal, and slow, till the day before he died, then intermitted a little, but his senses were perfect even till death closed the miserable scene.*

The

* See a case in the 2d volume, in which sixty-eight biliary concretions were discharged at an abscess, formed
just

The *spleen* is an oblong, flat body, of a livid colour; its substance is soft, and texture very loose; it lies in the left *hypochondrium*, in contact, on its superior side, which is convex, with the *diaphragm*, and its inferior side rests upon the stomach, colon, and kidney.

There is no material difference in the consequences of a wound in this organ and of one in the *liver*. It is not quite so dangerous in its nature, but requires to be treated in the same manner, in general, as a wound in the *liver*.

It is unnecessary to add any thing here concerning wounds of the *aorta*, *vena cava*, and other large blood-vessels belonging to this region, after what has been said in pag. 102, 366.

The *pancreas*, is a long flat conglomerate gland, situated behind the stomach, lying across the *spine*, between the *liver* and the *spleen*; its excretory *duct* opens into the
duodenum,

just beneath the false ribs. This patient, enjoyed good health many years after, keeping the fistulous ulcer open with a *canula*.

duodenum, with the *ductus communis chole-*
dochus.*

We have no criterion to inform us, with certainty, when this part is wounded ; our judgment can only be conjectural, founded upon general rules, as an observance of the direction of the weapon, &c. but a wound by which the *duct* of this gland is opened, must be deemed very dangerous ; because the fluid that should pass through, and be discharged into the *duodenum*, will fall into the cavity of the *abdomen*. Wounds in this part require only the general treatment.

In wounds in any part of the *abdomen*, or its contents, as well as in the *thorax*, &c. if a cough attends the patient, it demands particular notice, and must be removed, or alleviated all we possibly can, by pectoral and balsamic remedies, with the assistance of opiates, as the urgency of the symptom requires ; because the action of coughing opposes every intention of cure.

The

* Vid. *Regnerum de Graaf de Succo Pancreatico*, with a beautiful figure of the *pancreas*, and its *duct* opening into the *duodenum*.

The kidneys are glandular organs, appointed to separate the aqueous with the saline parts, from the blood, and are situated, as has been observed, in the lateral cavities of the *abdomen*, the right, under the great lobe of the *liver*, and the left, under the *spleen*; the right, from being pressed upon the *liver*, is a little lower in its situation than the left; at their superior extremities, they are in contact with the *diaphragm*, and rest against the last ribs, and at their inferior, against the *ossa ilium*, lying upon the transverse processes of the *vertebræ lumborum*, surrounded with a great quantity of adipose membrane, which makes soft beds for them to lie in: they are oblong flat bodies, four or five inches long, and two or three broad, having their convexity towards the *spine*; and their substance is pretty solid.

Wounds of the kidneys are to be discovered, by considering their situation, and the general directions mentioned, relating to the exploration of wounds in the *viscera* of the *abdomen*. They are attended with pain and tension of this region, sometimes extending farther, and if the instrument, by which the wound,

wound was inflicted, penetrated the *pelvis* of the kidney, urine will be evacuated by the wound, and blood mixed with it, through the *urethra*. These must be looked upon as dangerous wounds, but not so dangerous as those of the other *abdominal viscera*; though, as we have observed, strictly speaking, they lie out of the limits of the *abdomen*. They are to be treated as wounds of those parts, with the observance of general rules; and when the wound does enter into the *pelvis* of the kidney, natural balsams, as *bals. c. copaib.* &c. may be beneficially taken, drinking *aq. calcis*, after the pain, inflammation, and tension are off.—Three or four years ago, I was called, by an apothecary, to an elderly gentlewoman, who had long voided purulent matter with her urine, and found a very large abscess upon the region of the kidney, which had a communication with its *pelvis*; for, upon opening it, urine was discharged with the *pus*. Since this, she has enjoyed better health, than for many years before, and the only inconvenience remaining, is a small discharge of matter externally, requiring no dressing but a piece of common plaster.—

ter.—*Fallopian*, *Dodonæus*, &c. relate histories of cures in wounds of the kidneys.—Serjeant *Bernard's* narrative of consul *Hobson's* case, in the *Philos. Transf.* is well worth reading on this occasion.* The celebrated professor *Marchetti*, of *Padua*, performed the operation of *nephrotomy*, with success, upon this gentleman, when he was consul at *Venice*.†

The *ureters* are slender canals, running from the kidneys to the bladder, at the back of the *peritonæum*, without entering it; and after passing over the *musc. psoæ* in an oblique direction, they turn down into the *pelvis*, continuing their course between the *rectum* and the bladder; the *umbilical* arteries on one side, and the *vasa deferentia* on the other, penetrating the bladder on each side the *vesiculæ seminales*, making a triangle with
the

* See *Louthorp's* Abridgement, Ed. 3. vol. 3. pag. 188 & seq.

† See *Les cas ou Néphrotomie se fait avec succes par Monsf. Lafitte, en Mem. de l'Acad. Roy. des Chirurgie*, tom. 2. *Et Recherches historiques et critiques sur la Néphrotomie, ou Taille du Rein*, tom. 3. par *Monsf. Hevin*: and *Melanges de Chirurgie*, par *Monsf. Pouteau*.

the *meatus urinarius*, commonly at the distance of about an inch.

Wounds of the *ureters* are known by their situation, the direction of the instrument, &c. but it is difficult to discover them, and determine this point with precision; and it is scarce possible they should be wounded, without injuring some other parts of consequence. These wounds are more dangerous, than even those of the kidneys themselves; for the urine must fall into the *pelvis*, if not into the *abdomen*, and produce fatal symptoms in a short time, unless some way should be pointed out to evacuate it. In these cases we should allow the patient to drink but a small quantity of liquor, and that of the softest and most balsamic kind, void of any stimulating property, managing the wound in the same manner as wounds of the kidneys.

Though the following notes have no immediate connection with the subject, yet their singularity may render them acceptable.

In opening the body of a gentleman lately, aged about thirty, who died hectic some years after it was supposed he had been afflicted with true nephritic symptoms,
and

and voiding a large quantity of pure blood by the urinary passages, I found one of the *ureters* as impervious as a ligament, and much enlarged for a considerable space from the kidney, with purulent matter, but no calculous substance, in its *pelvis* or in the bladder.—About the same time I attended the opening the body of another gentleman, who died of a *diabetes*, and had long been affected with violent hypochondriac complaints. Nothing was found observable in this body, but an incysted aqueous tumour situated upon the superior part of the left kidney, where the arteries, ramified upon the cyst, were ossified, showing a gradation of the ossification from a cartilaginous to a perfect boney hardness, which upon bending, broke in some places and pierced the coats of those vessels.—I also once saw ossifications upon the surface of a *placenta uterina*.—See Vol. II.

OF WOUNDS OF THE PARTS CONTAINED IN
THE PELVIS.

THE boundaries of the *pelvis*, which contains the *bladder*, *rectum*, and *uterus* with its appendages are, forward the *os pubis*, backward the *os sacrum* above, the *os coccygis* below; laterally the *ilia* above and the *ischia* below. The *bladder* lies in the lower anterior part of the *pelvis*, upon the inside of the *symphysis* of the *os pubis*; it is divided into neck, body, and *fundus*, the latter of which is attached to the *peritonæum* by a ligament. When the *bladder* has but little urine in it, its *fundus* falls below the *symphysis* of the *os pubis*; but when distended with urine, if it is not become rigid and unyielding, it rises considerably above it. Its upper part is covered with the *peritonæum*, whence it is reflected, and expanded over the anterior part of the *rectum*; which expansion is formed into a kind of pouch, receiving part of the small *intestines*.

Wounds

Wounds of the *bladder* are discovered, by considering the situation of the part, the direction of the weapon, and the depth it entered ; and when it penetrates, urine is generally evacuated through the wound, which circumstance removes all doubt ; and a wound here is almost always attended with pain in the region of the *pubes* and groins. It is more or less dangerous, according to the part of the *bladder* that is wounded ; if it is in the *fundus*, towards the posterior part of it, or in any other, where the urine, in consequence of the wound, must necessarily fall into the cavity of the *abdomen*, it will inevitably prove mortal ; as frequently happened in performing the high operation for the stone ; on which account it was justly exploded, and certainly will not be practised again, except under particular circumstances. When the urine passes freely out of the *bladder*, and does not fall into the *abdomen*, we want not instances from *lithotomy* to evince, that wounds of this part are curable by the common treatment : and some surgeons, when the wound is at the *fundus* of the *bladder*, advise stitching the lips of the

wound and bladder together; as has been directed in wounds of the stomach and *intestines*, in order to prevent the falling of the urine into the *abdomen*.——Professor *Monro* says, that a soldier at *Sterling* was shot into his bladder, and the wound soon healed.——And *Monf. Petit* relates the case of an officer, that received a shot in this part, who seventeen years after was cut for the stone, and had the ball extracted, cased over with calculous matter.*

Before mentioning wounds of the *rectum*, we may consider those of the *uterus*; first cursorily taking notice of the situation and connexion of that body, and its appendages, in respect to the adjacent parts. After removing the contents of the *abdomen*, those of the *pelvis* appear, and we have in one view, the *colon* from the inferior sigmoid flexure, the *rectum*, and the *bladder*, the *uterus* lying between the two latter, with its appurtenances; as the *ligamenta lata*, which are only doublings of the *peritonæum*, through
which

* See what *Riverius*, *Glandorpheus*, *Felix Wurtz*, *Casparus Bauhinus*, &c. say upon this subject.

which the vessels pass to the *uterus*; the *ligamenta rotunda*, that run along in a serpentine course, upon the upper edge of the *ligamenta lata*, from the anterior corners of the *fundus uteri*, through the rings or sheaths of the *muscul. obliq. extern.* and are then lost in the cellular membrane of the groins; the *tubæ fallopianæ*, which arise from the corners of the *fundus uteri*, and are connected to the *ligamenta lata*; the *morsus diaboli*, a jagged body, ridiculously so called, resembling a fringe, at each extremity of those tubes; and the *ovaria* towards the back part of the *uterus*. The *vagina uteri* is of a spongy texture, having many *glands*, whose excretory *ducts*, called *lacunæ*, open into the whole extent of its internal surface; it is placed between the *rectum* and *meatus urinarius*, and connected to them, by the universal connecting substance, the cellular membrane, all which passages have a degree of obliquity in their direction. The *uterus* begins at the *ostinca*, where the *vagina* ends; it is situated at the bottom of the *pelvis*, between the *rectum* and the *bladder*, as has been observed; and these parts are strongly connected together,

ther, though left much at liberty, to allow of the necessary dilatation and contraction of each respectively, by the interposition of the *peritonæum*, which passes over them, from the one to the other, giving them their external covering.*

From the analogy of the symptoms, it is pretty hard to distinguish wounds of the *uterus* itself, from those of its appendages, in an unimpregnated state, as has been remarked; but, even in this case, should the weapon penetrate the cavity of the *uterus*, some appearance of blood may be discovered through the *vagina*, sufficient to direct our judgment with precision. When it is distended with the *fœtus*, wounds may be attended with such an effusion of blood, that nothing can save the patient but a speedy extraction of it; under which circumstance, the *cæsarian* operation is advisable, if it cannot be effected in any other manner; for after delivery, the

uterus

Vid. *Regnerum de Graaf de Mulierum Organis Generationi inservientibus: et Noortwyk de Utero humano gravido.*
 —Vid. etiam *Anatomiam Uteri humani gravidæ, celeberrimi Doctoris Hunteri Professoris Anatomici in Academia regali Londinensi, Figuris illustratam.*

uterus soon contracts, the divided vessels collapse, and the *hæmorrhage* stops. These wounds are to be looked upon of a very dangerous nature, and are to be treated according to general rules, like those of the *bladder*, &c. taking all possible care, in all of them, to prevent the falling of any thing into the cavity of the *pelvis* or *abdomen*.*

E e 4

Wounds

* See two Memoirs by Monf. *Simon*, upon the *cæsa-*rian operation, in the *Mem. de l'Acad. Roy. de Chirurg.* and doctor *Cyprianus's* letter to sir *Thomas Millington*, M. D. upon the same subject.—Some years ago I examined the body of a woman, who had an *extrauterine fœtus* extracted by piece-meal at an abscess, opened in the *umbilical* region, long after the term of gestation was expired. I found the parts that had suffered, perfectly healed, the woman enjoying a good state of health, but she had never since been pregnant. I received a very exact and circumstantial account of this case from the woman, and the surgeon who cured her.—*Albucaſis*, *Alexander Benedictus*, *Hildanus*, and other writers, have recorded histories of cases to this purpose.—Some time after these papers were printed, Mr. *Garneys*, a reputable surgeon at *Yoxford*, in *Suffolk*, assured me, of his own certain knowledge, that the above-mentioned woman became pregnant some years after I saw and examined her, and brought forth an healthy child at the completion of the usual term, without any more difficulty than ordinary,

Wounds of the *vagina uteri* are not very dangerous ; they are commonly attended with pain in the groins, *pubes*, and *sacral* region. —I have three times found large stones lying in such a favourable position to be cut upon through the *vagina uteri* and neck of the *bladder*, as to encourage me to proceed in that manner, preferable to any other ; and which gave the patients very little pain, either in making the wounds, or extraction of the stones. They were both cured in three weeks, with the happy consequence of retaining their urine perfectly well.*

Should

nary, but died in child-bed.—Also see a case to this purpose in the *London Med. Observations and Inquiries*, vol. ii. pag. 369.

* A surgeon of the highest character told me, he once was concerned in a case, where the whole *vagina* separated in a mortification, as far as the *os tinæ*, the patient recovering beyond expectation.

Paulus, Ætius, Benivenius, &c. speak of women who survived the loss of the *uterus* itself.

See in Vol. II. the case of a dangerous *hæmorrhage*, proceeding from a fungous excrescence upon one of the *lymphæ*.—Concerning exuberance of these parts, consult *Heister* and *Mauriceau* ; and an account of an incipient mortification there, in *Selingen, de Morb. mulierum*.

Should the *rectum* be wounded, and the *bladder* at the same time, it may prove very difficult to cure such a wound, on account of the urine falling continually upon it; as we see, when that accident happens in *lithotomy*: but when the *rectum* only is injured, and the wound can be easily come at, it readily admits of cure, as we observe after the operation for the *fistula in ano*; in which case, when *sinuses* extend too high, to be opened with safety, balsamic injection, &c. may be used to advantage.

Three or four years ago, I was consulted, in the case of a woman upwards of thirty years of age, whose health was much impaired, by the long continuance of a very bad *fistula in ano*. Her surgeon had opened many *sinuses*, in different directions, and treated the case judiciously; but one remaining pretty high up the *rectum*, tending directly towards the *vagina uteri*, and discharging an ill-conditioned matter immoderately, which he durst not venture to open, perplexed him very much; on which account he desired me to visit her with him. By introducing my finger into the *vagina*, and the probe into
this

this *sinus*, I found it terminated just above the *carunculæ myrtiformes* : I proposed drawing a *seton* through the *rectum* into the *vagina*, which was agreed to, and the operation easily performed, with an instrument a little more curved than a tonsil-needle, having an eye towards the point. It succeeded so happily, that the discharge was obtained, at this depending opening in the *vagina*, with little or no inconvenience ; and after continuing the *seton* about three weeks, it was left out, and the cure completed without any farther trouble. She ventured to marry soon after, and brought forth a healthy child in less than a year ; since which she remains perfectly well.*

The composition of the *scrotum*, is chiefly loose skin, and *cellular* membrane without fat, which may be easily inflated with air ; and is a soft bed for the tender *testicles* to be reposed in.—Wounds in this part require no peculiar management, and in general heal kindly. A bag truss is the proper bandage, affixed

* This case, with something more upon the subject, is inserted in Vol. II.

affixed to a waistband, to receive and support the part.—In *anasarcous* dropsies, the *cellular* membrane here is sometimes excessively loaded with water, distending the part to an enormous size; under which circumstances, I have made scarifications several times with advantage, and without any bad accidents ensuing.

The *testes* are originally situated in the *abdomen*, just beneath the *kidnies*, and gradually descend, near the time of birth, through the sheath of the *spermatic* cord into the *scrotum*, each carrying along with it a *peritonæal* coat, making the *tunicæ vaginales*.—This anatomical discovery of doctor *Hunter's*, explains the nature of the *hernia congenita*, or that species of rupture, where the *intestine* and *testicle* are found in contact; which before could not be accounted for, only upon a supposition of there being, at the same time, a laceration of the *peritonæum*.*

The

* This discovery was made by doctor *Hunter*, in the year 1755, assisted by the diligent investigation of his brother, Mr. *John Hunter*, a very accurate and indefatigable anatomist, and an excellent surgeon; and it was demonstrated

The *spermatic* cord is composed of an artery, vein, nerve, lymphatics, *vas deferens*, the cremaster muscle, and aponeurotic membrane, derived from the opening of the *mus. obliq. extern.* They are connected by *cellular* membrane ; which also makes the sheath of the cord, and through that the *intestine* descends, before the vessels, in a rupture.*

The figure of the *testes* is of a flattish oval ; they are soft and glandular, and tubular with great tortuosity, and are appointed to secrete and elaborate the *semen* ; they are left very loose and moveable in the *scrotum*, by which means, they are much less liable to external injuries.—The *epididymides* are vascular bodies, attached to the posterior parts of the *testes*, in which the seminal *ducts* unite, forming the *vasa deferentia* ; which convey the *semen*, prepared by the *testes*, to its reservoirs, the *vesiculæ seminales*, lying upon the inferior

demonstrated by the doctor, in his lectures, that year.—See Mr. *John Hunter's* observation on the state of the *testes* in a *fœtus*, and on the *hernia congenita*, in doctor *Hunter's* Medical Commentaries.

* See an extraordinary case of a *circocoele* requiring castration, in Vol. II.

inferior part of the *bladder*, beyond the *prostate gland*. Should these bodies, or their *ducts*, happen to be injured in *lithotomy*, the patient may be injured for the office of procreation.

According to the nature, texture, and sensibility of the *testes*, and their appendages, the *epididymides*, wounds in them are to be treated with great care and gentleness, observing general rules; and should the *spermatic* cord be wounded, no particular management is required; but in wounds of the *testicles*, &c. the *scrotum* must always be supported with a bag-truss; which should not be omitted when only the cord is injured.

When the radical cure of the *hydrops tunicæ vaginalis* is attempted, from what I have observed in patients of my own, as well as of others, I am fully convinced, that the best method is, to take out an oval piece by incision. And, in castration, from a great many examples, and strict attention, I have not the least doubt upon my mind, concerning the propriety of taking up only
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the *spermatic* artery, in order to obviate severe symptoms; which I have seen arise, beyond dispute, in consequence of tying the whole cord. Concerning both these operations, I have said something more in another place, founded upon incontestible evidence.*

The teguments of the *penis* are a loose skin, and *cellular* membrane without fat, like that of the *scrotum*, which may also be inflated to a great degree by blowing air into it; and there is a reduplication, forming a kind of hood to the *glans penis*, called the *prepuce*. The body of the *penis* is made up of two *corpora cavernosa*, the *corpus spongiosum urethræ*, and two pair of muscles, called the *erectores penis* and *acceleratores urinæ*. The *corpora cavernosa* arise distinctly from the *ossa pub.* and *isch.* and at their origin, are called *crura penis*, and will admit of inflation. The *corpus spongiosum* swells out at its beginning, making what is called the bulb of the *urethra*, and at its termination, it makes the *glans penis*; along this body runs the

* See Vol. II.

the *urethra*, which is also of a spongy texture, vascular and glandular. The inside of this canal is lined with a delicate membrane, pierced in many places, through its whole extent, by the excretory *ducts* of *glands* called *lacunæ*; by which means it is constantly supplied and imbued with a viscid fluid, or *mucus*, to defend it from the acrimony of the urine; and there are *lymphatics*, running from hence to the *vesiculæ seminales*, which have lately been filled with quicksilver by Mr. *Watson*, an ingenious anatomist in *London*. The first pair of muscles arise from the tuberosities of the *ossa isch.* run in the direction of the *crura penis*, and are lost upon the aponeurotic sheath of the *corpora cavernosa*. The second arise between the *crura penis* and soon join, making a tendinous ring round the *urethra*; from thence they proceed to the *sphincter ani*, and are lost in that muscle. On the back of the *penis*, between the *corpora cavernosa*, runs the *vena magna*, so called by modern anatomists; and into each of these bodies enter an artery, vein, and nerve, distributing their branches.

When

When we duly consider the nature, structure, and combination of the parts, composing the *penis*, it must evidently appear, that deep wounds in it demand more attention than ordinary, though the general rules are to be observed in the treatment of them.*

When a stone is lodged in the *urethra*, and it is found necessary to cut upon it in order to extract it, the general method directed is, to make the wound laterally into that canal, first drawing up the skin, &c. of the *penis*, enough to be slipped down and cover over the other part of the wound, with a view of expediting the cure, and preventing a *fistula* in consequence of the operation; but this method seems more likely to cause, than obviate, inconveniences; as the urine may then be diffused in the *cellular* membrane, occasioning inflammation, &c. and bring on the very evil, we are studying to avoid: therefore it appears more eligible, to endeavour to make the wound in the skin and *cellular* membrane correspond with that in the *urethra*; keeping the lips of it together, with a strip of
of

* Vid. *Traëtatum Regneri De Graaf, de Virorum Organis Generationi inservientibus.*

of common plaster, having a slit in the middle to be used as the uniting bandage, after applying to the wound, a very thin, even pledget of some vulnerary balsam, as directed in incised wounds. This method I have practised much to my satisfaction.

I have divided the *prepuce* several times in *phimoses*, without any ill accidents supervening; but I have been informed, by two eminent practitioners, who were eye-witnesses, of mortifications happening in consequence of this seeming slight operation, in patients of cachectic habits; which disastrous events should admonish us to act with precaution.

Previous to operations in surgery, it is certainly a matter of the utmost importance, to rectify what is amiss in the patient's health and constitution, as far as possible: an inattention to these things, I am persuaded, has frequently prevented success attending operations, that have been well performed; after which, the greatest degree of circumspection is also demanded, and sometimes found absolutely necessary, to obtain the proposed end and design of them; and indeed this observance cannot be too earnestly inculcated.

OF WOUNDS OF THE EXTREMITIES.

HAVING gone through the treatment of wounds of the three cavities, &c. and, in the general history of them, considered those of the teguments, muscles, tendons, arteries, veins, lymphatics, nerves, &c. little is left to be said concerning wounds of the extremities, but to recommend a good anatomical knowledge of the structure, mechanism, and use of these parts ; which, joined to the general rules laid down for the management of such accidents, will prove a sufficient direction, what measures to take, in the various kinds of them, however complicated.

We must always remember, as has before been remarked, that whenever a muscle or tendon is divided, totally or partially, it is of great consequence, to place the limb in a favourable position to relax it, that the undivided part may not be put upon the stretch, or the ends drawn more asunder, which require to be kept, as near together as possible, when they cannot be kept quite in contact :
and

and should the future be practised in either of these cases, it is necessary to give rather more attention to this circumstance. Here I may just repeat the proper posture to put the limb in, when the *tendo achillis* is wounded; which is effected by bending the knee and extending the foot, to such a degree as leaves the part most at ease.

The most formidable wounds of the limbs, are those accompanied with fractures of the bones; to which part of surgery I have spoken sufficiently, in a little work I printed a few years ago, now reprinted with additions, and see no manner of reason to alter my sentiments, the same success still attending the same method.

All kinds of wounds of the joints require the gentlest and mildest treatment and applications, with the utmost care and attention to prevent pain, inflammation, and fever, according to the rules we have had occasion to mention repeatedly, in the course of this treatise: and probably the wrapping the whole part up at first, in a warm, emollient cataplasm, renewing it as often as it grows cold, might prove the happy means

of obviating bad accidents, in these threatening cases.

In a wound of a lower extremity, it is advisable to confine the patient to his bed ; and when in the joint, that injunction must be peremptorily insisted upon, keeping the limb as much at rest, as in a luxation or fracture, in order to have the main intentions of cure more effectually answered : however, as soon as the part will bear gentle motion frequently, that will be requisite, as a means of preventing an immobility of the joint.

Wounds of the joints, made either by puncture or incision, are of a very dangerous nature, as they are surrounded with tendinous and membranous parts ; which though not very sensible in a sound state, as we have observed ; yet when inflamed, they become exquisitely sensible, often attended with vehement pain and fever, and sometimes with delirious symptoms.* The danger is still increased, when the wound penetrates the *capsular* ligament ; a case which may be discovered by the probe, and generally by a discharge of the *synovia*, secreted by glands in

* See doctor *Hunter's* Commentaries, part i. pag. 69.

in the joint, to facilitate its motion ; but as a discharge of a similar kind may deceive our judgment, proceeding from wounds in the *sacculi mucosi*, which lie under the tendons of some long muscles that play upon bones near, or over joints, furnishing them with such a lubricating fluid, to prevent the ill effects of friction, we should be acquainted with the situation of these little membranous bags, that we may not immediately conclude the wound penetrates the joint, from the appearance of the fluid discharged, without farther consideration. Wounds, that enter the joints, must be looked upon as much more dangerous than those in which only these *sacculi* or *bursæ* are opened, and they will generally afford a larger synovial discharge.

When an atrophy follows a wound in a limb, with or without rigidity of the joint, nothing carries so much probability of giving relief as pumping at *Bath* ; but, as a substitute, warm water may be poured upon it at home, in imitation of that ; using good friction with a flesh brush to the wasted, and emollient embrocations to the rigid parts, giving them gentle motions as early as they

will admit of being moved, without creating much pain, as has been advised. The water for this purpose may easily be impregnated with warm plants, &c. giving it, in some degree, the virtues of the natural baths.*

I have inserted the following list of the *sacculi mucosi*; it appearing of some consequence, to distinguish whether the wound penetrates the joint, or only a *sacculus* is opened; which consideration I do not find has been paid any regard to, in respect to wounds contiguous to the joints, by any writer in surgery.†

A LIST

* In respect to wounds of the extremities and articulations, we may consult *Glandorpius*, *Wifeman*, *Paré*, *Forestus*, *Dodonæus*, *Placentinus*, &c. and *Hildanus's* dissertation, *de Ichore*, among his other works, is well worth reading on this occasion.

† Our great master in anatomy, doctor *Hunter*, calls these little, fine membranous bags, *sacculi mucosi*, and the celebrated *Albinus*, *bursæ mucosæ*, in his *Historia Musculorum*.—It is said that *Bellini* first observed them.

A LIST of the *Sacculi mucosi*, with their situation and connection. They may be made very conspicuous by inflation.

1	<i>Deltoides.</i>	A large one situated under this muscle upon the <i>acromion scapulæ</i> . A small one, investing the tubercle of the <i>radius</i> , both on the side where the tendon is fixed, and also on the other side, where there is no tendon; it adheres strongly to the whole tubercle, and loosely to part of the <i>supinator brevis</i> , under which it lies, as well as under the tendon of the <i>biceps</i> .
2	<i>Biceps Brachii.</i>	
3	<i>Iliacus internus</i> and <i>Psoas</i> .	A large thin and pliable one is found upon the <i>ischium</i> , beneath the tendons of the <i>iliacus internus</i> and <i>psoas</i> , as they pass down to their insertions in the <i>os femoris</i> ; it is attached to these tendons, and to the anterior surface of the <i>capsular</i> ligament; and this <i>sacculus</i> sometimes communicates with the joint, as I have observed.
4	<i>Latissimus Dorsi</i> and <i>Teres Major</i> .	One is situated between the extremities of the tendons of these muscles, adhering strongly to them.
5	<i>Gluteus max.</i>	A large thin one, firmly connected by a small part of it to the back of the <i>trochanter</i> , immediately under the termination of the <i>gluteus medius</i> , and is loosely attached to the rest of the <i>trochanter</i> and the tendon of the <i>gluteus maximus</i> .

6	<i>Gluteus medius.</i>	A small one, situated between the termination of its tendon, and that of the <i>pyriformis</i> , adhering to both.
7	<i>Gluteus minim.</i>	A small thin one, attached to its tendon and the <i>trochanter major</i> .
8	<i>Gemini.</i>	A small one between them and the termination of the <i>obturator internus</i> , connected to both, and to that part of the <i>capsula</i> of the joint, which lies under the <i>gemini</i> .
9	<i>Biceps Cruris.</i>	One is situated between the end of its tendon exteriorly, and the <i>capsular</i> ligament of the knee adhering to both.
10	<i>Semimembranosus.</i>	A small one lies between its tendon, which runs between the inner condyle of the <i>tibia</i> , and the <i>capsular</i> ligament of the joint.
11	<i>Cruralis & Vasti.</i>	Behind the tendons of the <i>cruralis</i> and <i>vasti</i> , there is a thin but large one, connected to those tendons before they join; and after their junction, it is fixed to the <i>patella</i> ; it also adheres to the <i>capsula</i> of the joint, that expands itself over the bone.
12	<i>Gracilis, Sartorius, & Semitendinosus.</i>	Under the extremities of the tendons of these muscles is a large one, adhering to them on one side, and on the other to the <i>capsular</i> ligament of the knee, on the inside where these tendons play.
13	<i>Gemellus.</i>	A large one lies under its inner head, firmly attached to its tendinous origin, also to the extremity of the <i>semitendinosus</i> and the <i>capsula</i> of the knee near the anterior condyle. <i>Soleus.</i>

14	<i>Soleus.</i>	The tendon of the <i>soleus</i> passes over the upper part of the <i>os calcis</i> , between which and the bone, lies a large <i>sacculus</i> ; and near that is found a glandular body, which furnishes a mucous fluid for the more effectual lubrication of these parts, that are in such constant motion in walking.
15	<i>Tibialis anticus.</i>	A small one is fixed to the tendon a little before its termination, where it plays on the top of the foot.
16	<i>Peroneus longus.</i>	One lies under the tendon of this muscle, where it plays over the <i>os cuneiforme</i> on the outside of the foot.

Many years ago, before I had any knowledge of these *sacculi*, I was called to a young man, who had received a wound, with the bill of a wood-hook, on the inside of his knee, just above the joint, whence proceeded a synovial discharge, which made me then apprehend it penetrated the *bursal* ligament; but the wound healing kindly, by the common treatment, without ill accidents supervening, I have since been inclined to think, upon reflection, that the weapon only penetrated one of these *sacculi*, and not the joint.*

OF

* Probably in these *sacculi* disorders may be seated deserving future consideration.

OF GUN-SHOT WOUNDS.

SURGEONS of the greatest abilities and experience having amply treated this subject, I shall be very brief upon it.

Gun-shot wounds are the most complicated, and to be considered as the worst sort of contused and lacerated wounds. Should the external openings be small, they require immediate enlargement ; which, besides answering other good purposes, gives room to extract extraneous bodies, as we have directed in the general treatment of wounds : and after the extraction of a ball or other solid body, we ought to be particularly careful in our search, lest any part of the garments, that may have been carried in with it, should be left behind, which would infallibly obstruct the cure, and probably produce worse symptoms, than even the ball itself : and, above all things, we should endeavour to obtain free and depending openings. The management of these wounds differs in nothing material from that which

is proper, and has been advised, in other contused and lacerated wounds, observing the same rules; only, as the digestion of the wound advances, and the contused and lacerated parts, that have lost their vitality, by the force of the ball, separate, (which is called the fall of the *eschar*, a term early introduced, upon a supposition of that slough being caused by burning) there is danger of an *hæmorrhage*, for obvious reasons, which is a matter of such importance as demands particular attention; and therefore, when such a wound happens in a limb, the leaving a tourniquet ligature loose about it, with directions to an attendant to use it occasionally, till the surgeon can be called, is a precaution that may prove the means of saving the patient's life.—The applications should be of the most lenient kind at first; and nothing, in all probability, would contribute so much to prevent bad consequences, when the limbs are thus wounded, as wrapping them up as soon as possible in a soft, emollient poultice, prepared with bread and milk, and having a good portion of oil in it, applying it moderately warm, to excite
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a pleasing, not a painful sensation, renewing it as often as it grows cold : and, from a little experience I have had in these accidents, I think, the balsam mentioned in pag. 139, is very suitable to dress the wounds with.—Bleeding, laxatives, and an exact regimen, are to be strictly observed. The patient's constitution, state of health before the accident, his customary way of living, the climate, and season of the year, are to be considered ; and all the non-naturals duly regulated, as we have already mentioned, concerning the general treatment of wounds, in the first part of this treatise. But it too frequently happens in gun-shot wounds of the limbs, and more especially when in the joints, that there is no resource, but speedy amputation, to preserve the patient's life, before inflammation, fever, and a train of bad symptoms supervene. The method then of performing that dreadful operation, and the manner of dressing after it, which I have advised in remarks published some years ago, I cannot now help strongly recommending and inculcating, from the constant success which has attended it in
my

my own practice, in a great number of instances : especially too as other surgeons, who have followed the same method, upon my recommendation, have given me the satisfaction of their full approbation of it.* Though the first dressings, after amputation, should not be removed, till they are ready of themselves to fall off ; yet, if the gleet proves offensive, such part of them, as can be easily taken away, should by all means be removed, and clean proper dressings, so far, applied to the stump ; in order to prevent that inconvenience, or the matter, which may have acquired a degree of acrimony, from excoriating the skin, &c.

In

* See Vol. II.——In many amputations which I have been concerned in within a few years ; I have used a pair of dissecting *forceps*, to take hold of the edges of the considerable arteries, that could easily be come at, drawing them out a little way, just to give an opportunity of passing the needle, so as to include only a small portion of *cellular* membrane in the ligature with the vessel, in order to prevent its slipping off.——See more to this purpose in Vol. III.

In large contused and lacerated wounds, whether made by gun-shot or otherwise, after bleeding repeated as the urgency of the symptoms require, and the nature and strength of the patient's constitution will allow, with a due observance of the other necessary rules which have been mentioned, the *bark*, if nothing contraindicates its use, may prove very beneficial ; particularly when there is a tendency to mortification, in a patient whose solids are lax. under which circumstance, it is most likely to prove efficacious, for self-evident reasons.—Should it be thought proper to administer a cordial remedy, at the same time with the *bark*, perhaps nothing can equal that which has *camphire* in its composition ; and larger doses of this very active drug, than are commonly given, may safely be ventured upon, on some occasions.—The *bark* has also a singular property in meliorating the suppuration, as well as in stopping a mortification, as experience has evinced, within a few years ; and it has been prescribed, to answer that very intention, by the most eminent practitioners :
indeed,

indeed, it may reasonably be conceived to serve both purposes, upon the same supposed *modus operandi*.—It is often found of great advantage, to join *rhubarb* in small quantities with the *bark*; which rational practice was first introduced upon doctor *Mead's* authority, in order to prevent the inconveniences arising from costiveness in the use of it; a false notion prevailing before, that if it had not that effect, it would not answer the proposed end.*

The method which Mr. serjeant *Ranby* has urged, with respect to the management of gun-shot wounds, in his treatise written after attending his late majesty in his *German* expedition, being founded upon rational principles, and supported by great experience, deserves to have all due regard paid to it.—*Wiseman*, *Heister*, and *Le Dran*, and many dissertations in the 2d vol. of the *Mem. de l'Acad. Roy. de Chirurgie*, are well worth reading on this subject.—Mons. *Desport's* treatise, upon this kind of wounds, bears a
great

* Mr. *Rusworth*, an eminent surgeon at *Northampton*, I think, was the first who wrote professedly upon the use of the *bark* in mortifications.

great character in the history of the *Royal Academy of Surgery* at *Paris*, prefixed to the 3d vol. of the *Memoirs* of that respectable body; where it is also mentioned, that *Monf. Louis* was about writing upon the same subject.—There is also an excellent dissertation upon gun-shot wounds, by *Monf. Le Cat*, an eminent surgeon at *Rouen*, in the 1st vol. of the prize *Memoirs* of this society.*

OF

* *Ambroise Paré* was a great reformer of surgery; he dressed gun-shot wounds more gently than any of his predecessors, whose applications were too severe and painful, having erroneous notions of the nature of such wounds, from their appearances.—*Monf. Martiniere* and *Vacher*, in their *Memoires sur les playes d'armes a feu*, animadvert upon *Bilguer's Dissertatio medico-chirurgica, de inutilitate amputationis membrorum. Mem. de l'Acad. Roy. de Chirurgie, tom. 4.*

OF BURNS.

BURNS are of various kinds, proceeding from fire itself, or from other matter, fluid or solid, that is heated, melted, or fused by fire, producing the same effect.

When the burn, or scald (so termed if the effect proceeds from any hot liquor) is superficial, only raising the *cuticle* in vesications, the frequent use of *ol. lini*, or *ol. olivar.* applied warm with a feather, and a plaster of the *cerate* mentioned in p. 202, or some such mild application over it, will generally be found sufficient to answer the purpose; but when it penetrates deep, destroying the vitality of the vascular compages, and inducing an *eschar*, then digestives are advisable, to assist nature in the separation of it; after which, the wound requires great care in the healing, by the common rules, in order to prevent deformity of the *cicatrix*, to which it is much more liable than other wounds. Should the fingers be burnt, plasters must be applied in such a manner as may hinder their coali-

tion, which inconvenience will follow, if they are suffered to be in contact ; some such instances I have seen, through this inadvertence, which proved difficult to remedy. In some cases, the hand-machine, described in the second volume of this work, may prove of considerable use, to give an opportunity of preserving the flexion and extension of these parts ; for want of which machine, a piece of stiff paper may be formed, and adapted to the same purpose, with proper padding and bandage : which attention should not be looked upon as trivial, considering the extensive usefulness of the fingers.

In case much pain and inflammation should attend these accidents, venesection, gentle purging, &c. with soft emollient cataplasms, of bread, milk, and oil, and such applications, as directed in other wounds, must be used ; and should the pain become very severe, *opiates* must be given to assuage it.*

T H E

* See an extraordinary case, in Vol. II. of a burn by a fiery meteor.

T H E

METHOD OF OPENING A DEAD BODY.

SURGEONS are often called on this occasion, in order to investigate the cause and seat of diseases and death, either by the relations of the deceased, or the magistrates of justice, to whom report is to be made; therefore at the time of performing this operation, minutes should be taken of what is observed. Dexterity and neatness, in the performance of it, are of consequence to the surgeon; as the eyes of spectators are upon him, making their remarks.

The instruments, and all things necessary, should be disposed in order, as for any other operation; as knives, a razor, a great and small saw, scissars straight and curved, elevators, needles threaded, sponges, tow, saw-dust or bran, basons with water, towels, and receivers for the *viscera*, when they are to be taken out of their cavities; and should the

body have undergone any degree of putrefaction making it offensive, it will be right to have a mixture of lavender-water and vinegar, or some such thing, to sprinkle it with, &c.

The body is to be laid upon a suitable table, advantageously placed for the light, having a cloth thrown over the parts which decency demands should be concealed, especially in females.

When it is intended only to inspect the *abdomen* and its contents, a longitudinal incision from the *xiphoid cartilage* to the *os pubis*, intersected by a transverse one at the navel, will give a fair opportunity of answering these purposes, when the angles are reversed.

Should it be required to examine all the three cavities, and the parts contained in them, we are to begin by opening the head, making an excision quite across to the bone, from ear to ear; which section is preferable to the *crucial*, commonly made on this occasion: then the scalp may be easily dissected from the skull, and turned down over the
face,

face, and towards the neck, giving room for the saw. The head must be held very steadily by an assistant, during the sawing, which should be begun on the middle of the *frontal*, proceeding to each *temporal* bone, and so to finish the circle upon the middle of the *occipital* bone, which may generally be done conveniently enough, by raising the head and inclining it forward, after having proceeded as far as this bone; or the body may then be turned prone, should that posture be found more convenient, to complete the circle. The cap of skull is then to be raised with the elevator, occasionally cutting the *dura mater* adhesions: after this the *encephalon* is to be removed, carefully separating the other attachments of the *dura mater*.

In order to bring the *thorax* and *abdomen*, with the parts contained in these cavities, under one view, an incision is to be made on each side the *sternum*, in the course of the *cartilages* of the ribs, which are annexed to it; dissecting from thence the muscles with the teguments, the space of two or three inches toward the *spine*; then cutting through

the *cartilages*, which will be seen, and easily divided with a knife a little curved near the point: then the incisions are to be continued from the *sternum*, through the *abdominal* cavity, in an oblique direction, to each *ileon* or *inguen*; after which the *clavicles* are to be separated from the *sternum*, or this bone divided at its superior cartilaginous junction, with a strong knife, dissecting it from the *mediastinum*, and turning it downwards with the muscles, &c. of the *abdomen*. This is the most eligible manner of opening these cavities, and gives an opportunity of sewing them up, with a better appearance for any person's view afterwards. That kind of stitch, called by sempstresses fine-drawing, or a flat seam, as here represented, though not mentioned by chirurgical writers, has a very pretty and neat effect upon these occasions.



If it is proposed to take out the *thoracic* and *abdominal viscera* together, for farther examination, the *diaphragm* is first to be cut down to the *spine* on both sides; then, to avoid being incommoded with blood, &c.

two

two very strong ligatures are to be passed round the *œsophagus* and large blood-vessels, in which the *trachea* may be included; tying them strait, and then dividing these parts between the ligatures: the same measures are to be taken in respect to the inferior vessels, upon the *lumbar* region, a little above the bifurcation of the *aorta*, including the *vena cava*; and also upon the *rectum*. After having observed these precautions, the *viscera*, with the *diaphragm*, are to be removed, by a wary dissection, all the way close to the *spine*; and gently drawing them, at the same time, will greatly facilitate the separation.

When the *thoracic* and *abdominal viscera* are to be taken out separately, in the first case ligatures must be made as have been described upon the vessels, &c. just above the *diaphragm*, and in the other just below it, and upon the *rectum*.

Should we be called upon to perform this office, when the body is become very putrid, it will be absolutely necessary to have such parts of it well washed with warm vinegar and brandy, and then sprinkled with lavender-water, or some such odoriferous, anti-

putrescent liquor before the examination, in order to correct the stench, and defend us against the noxious quality of the effluvia; the neglect of which precaution may be attended with very direful effects, of which we have instances. I have lately been concerned on two occasions, where it appeared absolutely necessary to use such means as might prevent the like consequences.

OF

OF EMBALMING DEAD BODIES.

IN the early ages of the world, the practice of embalming dead bodies was very common, particularly among the *Egyptians*, as we have observed in the introduction; but it has long been disused in almost all countries, except for great personages.

What I have principally to say on this head, which I thought might prove acceptable, was communicated to me some years ago, by a person of great character, and well acquainted with the modern practice of embalming in this kingdom.

After evisceration, as has been directed in opening a dead body, and continuing the incision farther upwards, even into the mouth, and, if practicable, without cutting the skin of the neck, all the cavities are to be well cleansed, and the humidity sucked up with sponges, then washed with *inct. myrrhæ*, and filled with a *species*, compounded of fragrant herbs, aromatic drugs, and gums reduced to powder, not very fine, first restoring the
heart

heart to its former residence, after having opened its ventricles, cleansed and washed them with the tincture, stuffed them with the *species*, and sewed them up; and then the cavities are to be stitched very close with the glover's or spiral suture.—Large and deep incisions are also to be made in all the most fleshy parts, cleaning and washing them with the tincture in the same manner, filling them with the antiseptic *species*, and stitching them up.—Then the head, trunk, and limbs, are to be perfectly well covered with cerecloth; putting a piece under the chin, to be secured by sewing on the top of the head, after having well adjusted the cap of the skull, sewed the scalp together, and cleaned the mouth, as has been directed for the other parts, and putting in some of the *species*.—The cerecloth is to be prepared with a composition made of wax, rosin, storax, and painter's drying oil, S. A.—After the application of the cerecloth, with great care and exactness, cut into suitable pieces, according to the respective parts, and closing them well every where; the face, being close shaved, is to be covered with
some

some of the above composition melted, and laid on with a brush of a proper degree of heat, and of a moderate thickness ; which may have a faint flesh-colour given it with vermilion, and when it is grown cold and stiff upon this part, it may be lightly struck over with hard varnish ; or this varnish, applied thick, may here serve the purpose alone.—A cap is to be well adapted to the head, falling down upon the neck, and to be sewed under the chin, making a few circular turns about the neck with a roller of a fit breadth.—All the rest of the corpse is to be inclosed in a sheet, to be artfully cut, and sewed on very close and smooth, with the finest tape, and such a seam as is described in page 454 ; over which an appropriate dress is to be put, as the relations or friends think fit to direct and appoint, and then laid into the coffin, which should be in readiness : but when it is some great personage, who is to lie in state for public view, before the funeral rites are solemnized, the dress must be appropriated to his dignity and character.—The brain and other *viscera* are to be put, with some of the *species*, into a leaden box.

—Some-

—Sometimes the heart, prepared as has been directed, to preserve it from putrefaction, is deposited in an urn by itself.*

* See *Paré*, and *Dionis* at the conclusion of his surgical operations, upon embalming.—Mr. *Greenhill*, a very learned surgeon, published in quarto, in the year 1705, the *Art of Embalming*, and the several ways of preserving dead bodies, in most nations of the world, with their funeral rites and ceremonies.—Read the description *du Cabinet du Roi sur les Momies*, par *Mons. Buffon*, tom. 3.—In *Sprat's History of our Royal Society*, there is a remarkable account of the manner of embalming in the island of *Teneriffe*, communicated by a physician, who practised there twenty years.

END OF THE FIRST VOLUME.

